# The Builder.

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## *Building Contracts.**

LIKE most maxims, that of Pope that "A little learning is a dangerous thing" contains about an equal amount of truth and error. For every builder and architect who has anything like a real business to conduct must have some acquaintance with legal principles in regard to those questions of law which are concerned with building contracts. The architect especially must know, not only what are his own rights and duties, but also those of the contractor in relation to the building owner. At the same time, while each of these persons, architect or contractor, should know certain general principles, there is nothing more dangerous than for him to enter into legal details which should be kept entirely to lawyers. It is unfortunate, perhaps, that the nature of building contracts enables the law which affects them to be connected in a somewhat systematic manner with the general course of a building contract.

Speaking broadly, there is first of all the engagement of the architect by the building owner. There then follows the arrangement of the contract between the latter and the contractor; the carrying out of this engagement; the termination of it by the architect's final certificate; and sometimes, unfortunately, a dispute which is concluded by an arbitration or action at law, and the inevitable bill of costs. Unquestionably a great many disputes in regard to building contracts would be avoided if the legal position of the parties was constantly borne in mind, especially by the contractor and architect. In every contract which is properly drawn it is stipulated that extras shall be ordered in writing, and that they shall not be paid for unless this condition is complied with. Of course, as we all know, the final certificate of the architect can waive this condition, and consequently many builders are satisfied to execute extras under a verbal order, trusting to the important final certificate. If, however, from any cause whatever the architect refuses to sanction these illegal extras, as they may be called, by his final certificate, there is almost certain to be a dispute, and, perhaps, litigation. It is for this reason that Mr. Macey's work is of considerable value, because it is one which essentially appeals to the practical man. Shortly stated, it consists of conditions of contract, among which are interspersed legal and practical remarks with reference to a preliminary table of legal cases and general notes. This table is alphabetical in form, but it is somewhat larger than is necessary, since it appears to contain some cases which hardly fall within the scope of the work; for example, that of Lemmon *v.* Webb, in which it was decided that if the branches of trees from adjoining land overhang a man's property he can cut them off. Nor are the references to the Workmen's Compensation Act necessary.

There is also a tendency to state legal propositions too shortly; for example, when it is stated that no action lies against an arbitrator for negligence, the reader ought to know that it is because he is acting in a judicial capacity. Subject, however, to this criticism, the book is ably and ingeniously compiled. One could have wished that as regards the relations of the building owner and contractor the part relating to tender had come first. It falls, however, under Clause 4 of the contract. As it is, the following clause is printed:—"The contractor shall make his tender for carrying out the works by filling up the form of tender annexed at the end of specification, and such form is not to be detached, and no tender of the contractors will be considered other than on that form." We then turn to p. 194, where we find the form of tender, and in regard to this it is pointed out that a tender may be withdrawn any time before acceptance, and that the acceptance of a tender by a corporation must as a general rule be under seal. This necessity for having all contracts with corporations under seal is one of the most important points for a builder to bear in mind, since innumerable disputes have arisen from the want of this formality. We are surprised not to find some of the numerous cases which have been decided to this effect in the table of cases.

There is no more important point in regard to building contracts than that which concerns the taking out of quantities; and unquestionably an architect should, if possible, employ a surveyor for this purpose. There is no doubt that an architect has an implied authority to employ a surveyor to take out the quantities. It is equally clear, however, that an architect is not prohibited by law from taking out the quantities himself—this was a point decided in the case of Foreshaw *v.* Lord Waterpark, reported in the *Builder* on June 23, 1900, as well as in the more important case of Restell *v.* Nye, decided in the following year by a Divisional court, but in that case the judge pointed out that the employer should be informed that the architect himself is about to take out the quantities. "It is safer and wiser," says Mr. Macey, "for the architect, whether taking out the quantities himself, or when employing a quantity surveyor to do so, to inform the employer of his proposed action in the matter."

There are so many points in the sequence of events between the beginning and the end of a building contract that it would be impossible to do more than note one or two. Of these, whether from a legal or a practical point of view, none is of more importance than the date of completion of the work or the question of damages which result from its non-completion. This matter falls under No. 42 of Mr. Macey's conditions, but we think he would have done better in his

* "Conditions of Contract Relating to Building Works." By Frank W. Macey, Architect. Revised as to the strictly legal matter by B. T. Leverson, Barrister. London: Sweet & Maxwell, Ltd., and B. T. Batsford. 1902.

precedent to have omitted the preliminary words as to the date of the commencement of the work. There may be plenty of good reasons why a contractor should postpone the commencement of the business, and it is the completion which is the essential point. Mr. Macey suggests the words "within twelve calendar months, or by a specific time from date of signing contract," but the great point is that the contractor shall from the very beginning have the exact day of the month by which the work is to be completed fixed in his mind. On this point the writer, we think, might have been more emphatic. He does not refer to the leading case of Jones *v.* St. John's College, Oxford, in which it was decided that if a contractor agrees to complete by a fixed date, and it is physically impossible for him to do so, not on account of any unforeseen circumstances, but in the ordinary course of events, he is still liable for damages for breach of contract. This is the decision which, above all others, should be present to a contractor's mind, since in the stress of competition he is always inclined to give himself too short a time, and, in some cases, to trust to luck that he will finish the work by the agreed date. Mr. Macey refers to the case of Dodd *v.* Churton, decided in 1897, which is a complement to the case already mentioned, in which it was decided that if extra work was ordered, and by it the contractor was prevented from completing the contract in the specified time, the penalty cannot be enforced if such extra work is not specifically agreed to be done by such date. The following paragraph Mr. Macey says is often embodied in the date of completion clause:—"It shall be distinctly understood that as time is an important element in the contract, time shall be of the essence of the contract." The more simply a contract is worded, however, the better, and the chief point under this particular head is simply to have a date inserted which shall give a reasonable time for the completion of the contract, and by which the contractor shall from the very beginning shall determine to abide.

An interesting practical point, upon which, no doubt, a good many of our readers hold different opinions, is in regard to the clerk of the works. "The employment," says Mr. Macey, "of a clerk of works is not always a satisfactory matter. The clerk of works occupies a very difficult position. Heretofore he has always been an educated man, and unless the architect has sufficient work to assure him a permanent appointment, he cannot always be depended upon. By far the better plan to adopt is for the employer to allow the architect some additional fee for extra superintendence. The architect can then arrange with one of his assistants, with whom he is always in touch, to give more attention to the superintendence of the work than would otherwise be afforded." Opinions are sure to differ upon this point, because so much depends upon the ability and integrity of the clerk of the works, and men are prone to decide upon the capacity of a class by the particular capacity of one or two individuals with whom they have been brought into contact. The question of the employment of a clerk of the works, and of the date of the completion of a contract, illustrate, however, the large number of important and suggestive points which a perusal of Mr. Macey's work raises.

## HIGH-POWER GAS LAMPS AND THEIR COST.

FOR several years gas engineers have been endeavouring to devise an incandescent gas lamp suitable for the lighting of streets and industrial works, which will emit from one burner a light intensity equal to that of the 2,000 candle-power electric arc lamps, and at the same time be less costly. This task has not yet been fully accomplished, but during the last three years the success of the efforts made in this direction has been sufficient to induce the Corporation of London and the controlling authorities in many other towns to adopt, in many cases, the incandescent gas lamp in preference to electric arc lamps.

This success has been attained by the use of what is termed the "high pressure" system. In this country gas is supplied to consumers under a pressure of from 1 to 4 in. of water. For the high pressure system this pressure is increased by a water motor or other device to 10 or 12 in. before the gas passes to the incandescent burner. The effect of increasing the pressure of the gas passing into the burner is to increase the velocity of the stream of gas passing up into the mixing tube of the burner, and this increase in velocity causes an increase in the proportion of air drawn through the side air-holes of the burner, with the result that the flame temperature is increased and a more powerful light is emitted from the mantle. Instead of increasing the pressure of the gas, a similar result may be obtained by using the gas under the ordinary low pressure and sending a stream of compressed air into the mixing tube, as in the latest form of the Scott-Snell lamp.

The use of a special compressing apparatus for each lamp is somewhat costly, and should be quite unnecessary. The term "high pressure" applied to gas supplied under a pressure of 10 in. is somewhat misleading, for a 10-in. pressure is by no means a high pressure, and there is no reason why the gas companies should not be called upon to supply gas under this pressure. Every consumer can with ease reduce the pressure of the gas supplied to him to any desired point by means of an inexpensive governor, but the apparatus required to increase the pressure is more costly and occupies more space. The cost of supplying gas under a pressure of 10 in. from the gasworks would not approach that involved by the use of a separate compressing apparatus for each lamp, if high-pressure lamps came into general use.

In the United States, illuminating gas has for some years been distributed over large areas by Mr. F. H. Shelton under a pressure of 554 in. of water (20 lbs. per sq. in.) without increasing the loss by leakage and without perceptibly affecting the quality of the gas. It is true that the wrought-iron mains have to be of good quality and to be connected with great care, but it is quite time to adopt a higher standard of soundness for gas mains in British towns, and if American gas engineers can construct mains which remain gas-tight under 554-in. pressure, British gas engineers ought to be able to successfully accomplish distribution under a pressure of 10 in. The Mond Gas Company is about to distribute Mond gas in South Staffordshire under a pressure varying from 55 in. to 194 in. in the mains, and if Mond gas can be so distributed, there is little doubt that coal gas can be similarly treated. If, moreover, the supply of high-pressure gas necessitated the abandonment of all the cheap defective brackets and pendants now in use, and the introduction of gas-tight pipes and fittings, a notable achievement would have been effected.

With high-pressure gas it is not only possible to obtain more powerful lamps, but the intensity of light obtained per unit of gas consumed is also increased. The following table shows the average candle-power per cubic foot of gas consumed per hour obtained by the use of different descriptions of gas burners:—

| | Per cubic foot of gas per hour. |
|---|---|
| Flat-flame burners | 2·5 candles. |
| Argand burners | 3·0 " |
| Regenerative burners | 8.0 " |
| Ordinary incandescent burners | 20·0 " |
| High-pressure incandescent burners | 30.0 " |

By supplying gas to the burner under a pressure of 10 in., a 300 candle-power light is obtained with a consumption of 10 cubic ft. of gas per hour. By increasing the pressure to 54 in., Mr. Onslow, of Woolwich, has found that the light may be increased to 450 candle-power, while the consumption is increased to 15 cubic ft. per hour. It has been claimed that as much as forty candles per cubic ft. of gas consumed per hour can be obtained, but the writer's experience indicates that thirty candles per cubic ft. is a fair average.

To enable the gas lamps to bear comparison with the electric arc lamps it is usual to place two or three of these high-power gas burners in each lantern, or in separate lanterns supported by one column. In Ludgate-circus, London, high-pressure gas lamps may be seen side by side with electric arc lamps, and the gas lamps appear to be quite as efficient as the electric lights. Here the gas lamps are usually maintained in good working order, and the result is very satisfactory; but on the Tower Bridge, London Bridge, Southwark Bridge, and Blackfriars Bridge the mantles are not always kept in proper repair, and it is usually possible to find on these otherwise admirably lighted bridges several prominent advertisements of an objectionable feature of incandescent gaslighting, *i.e.*, the necessity of giving the mantles constant attention. Although mantles of unusual strength are manufactured for high-pressure lighting, they are very liable to break or get out of position.

In a paper recently communicated by Mr. Nasmith to the Manchester Association of Engineers reference is made to the Report of Mr. Newbigging to the Manchester Corporation upon a trial made with thirty-five lamps supplied with gas compressed by the Keith apparatus. The cost of the apparatus, connexions, and pipes for installation of thirty-five burners was 155*l.* 0s. 2d., while for maintenance for 347 hours the installation, including 10 per cent. interest on capital, the cost was 18*l.* 9s. 2d., the latter sum being made up as follows:—

| | £ | s. | d. |
|---|---|---|---|
| Gas, 83,000 c. ft. at 2s. 6d. per 1,000 | 10 | 7 | 6 |
| Water, 25,560 gals. at 4·85d. per 1,000 | 0 | 10 | 4 |
| Mantles and rods (two mantles allowed for each burner) | 4 | 7 | 7 |
| Extra attendance and glazing | 1 | 17 | 11 |
| Interest for one month at 10 per cent. | 1 | 5 | 10 |
| | £18 | 9 | 2 |

The relative cost of the various systems of lighting by gas is stated to be as follows :—

| | Cost per hour of maintaining a light of 1,000 c.-p. |
|---|---|
| Flat flame burners ..... | 7·5d. |
| Ordinary low-pressure incandescent burners..... | 1·96d. |
| High-pressure incandescent burners ..... ..... | 1·77d. |

Mr. A. W. Onslow, of Woolwich Arsenal, advocates the use of a much higher pressure than 10 in. In one of the Arsenal factories, in which 500 to 600 men are employed, and which is well filled with machinery of all descriptions, he has replaced 605 flat flames by 150 incandescent burners supplied with gas raised to a pressure of 54 in. by means of a rotary blower. The relative results obtained from the two forms of installation are stated to be as follows :—

| | Number of burners. | Gas consumed per hour. | Total candle-power. | Total cost per hour. |
|---|---|---|---|---|
| | | Cubic feet. | Candles | s. d. |
| Flat flame installation .. | 605 | 4,235 | 7,437 | 8 6½ |
| Incandescent installation | 150 | 2,250 | 64,950 | 6 10½ |

The 6s. 10½d. quoted as the working cost of the incandescent installation includes the cost of mantles, renewals, power, and every incidental charge. It appears, therefore, that in this factory a saving of 1s. 8d. per hour in the cost of lighting has been effected, and at the same time the intensity of the light obtained has been increased to nearly nine times the original candle-power, by the substitution of high-power incandescent gas burners for ordinary flat flame burners.

It is probable that the conditions at Woolwich are more favourable for high pressure lighting than in many other factories, but it is evident that, where proper supervision can be given to the burners, the incandescent system of gas lighting may be successfully introduced into workshops in which machinery is employed, and will result in a diminution in the heat evolved, a less vitiated atmosphere, and an appreciable pecuniary economy.

## NOTES.

**Form of Building Contract.**

THE Eighteenth Annual Report of the Institute of Builders contains some remarks on the proposed form of conditions of contract which was accepted by the Council of the Institute of Architects, as the result of a joint committee of representatives of the two Institutes, and rejected (in our opinion rightly) by the General Meeting of the Institute of Architects, because it included the application of the arbitration clause during the progress of the works to the case of materials condemned by the architect as unfit. The demand that an architect is not to condemn materials supplied for his building without the builder having the power to call in a third person to (possibly) reverse the architect's decision, seems to us simply preposterous; it is putting the architect in a position absolutely inconsistent either with self-respect or with proper control over the building. The language of the Institute of Builders' Report is, we admit, moderate enough, and those who do not know the facts would hardly gather from it what important issues are involved in the difference between the Architects and the Builders on this point. Builders may know that there are some unreasonable architects; on the other hand, architects know that there are some dishonest builders, who require a very tight hand over them. The plain fact is, that while the architect used to be master on the building works, the builder wants to be master now.

**The Ventilation of the Houses of Parliament.**

A FEW days ago there was a recurrence of the grumble which arises from time to time in the House of Commons in regard to the bad ventilation of the House and its accessory departments. It is difficult for those who are not in constant attendance in the House, as the representatives of general newspapers are, to realise how far these complaints are really justified; but we have a strong impression that some members would never be contented with anything, and that those who complain for the most part know little or nothing about the arrangements for ventilation. It is pretty obvious that Mr. Wylie, the member for Dumbartonshire, who brought forward the subject on the present occasion, does not, as he referred to ceiling gas-burners as the means of extract, whereas the extraction is performed by a fire at the bottom of a great up-cast shaft in the Victoria Tower, with a fan to aid it when necessary; at all events this was the arrangement when we went over the building with the clerk of works some years ago, with the express object of seeing the whole system; we have no reason to suppose that this system has been discontinued, and we can testify from observation that the extract current obtained by this means is a very strong one indeed. We quite agree that the system of admitting air through the floor matting is a bad one to begin with, and that it is time that a better system were introduced. But it would be well if members who bring forward resolutions as to the want of ventilation would make themselves properly acquainted with the facts before they make their complaints.

**Electric Supply Bill.**

WE are glad that the Bill promoted by the various London Local Authorities to enable them to purchase electric supply undertakings has passed the second reading, as it is only right that they should have an opportunity of stating their case to a Committee of the House of Commons. It seems rather hard that because in London several electric companies have been empowered to supply in more than one area and to set up generating stations outside of London that therefore the Act authorising the compulsory purchase of these undertakings is inoperative. The Bill was the result of a conference between the London Corporation, the County Council, and the various Local Authorities. Its main provisions were, first, to enable Local Authorities to combine for purchase; secondly, to enable the London County Council with the consent of the Local Authorities to purchase; thirdly, to bring undertakings for the supply of electricity in bulk within the Purchase Acts; and fourthly, to enable the London County Council to supply electricity to local authorities. The London County Council, in promoting the Bill, merely wished to secure for London the rights enjoyed by other communities. Mr. Gerald Balfour, who spoke strongly against the Bill, said that the Government was fully alive to the fact that, sooner or later, the problem must be dealt with by legislation. In his opinion, the question could not be settled now by what he described as a premature and ill-considered private Bill. Mr. Bryce said that the Bill had been brought in by the London County Council at the request of the great majority of the local authorities interested, who point out that vested interests in electric lighting are being created in their districts every day. The longer legislation is delayed the more hopeless will it be to deal with the purchase question in the broad way suggested by the President of the Board of Trade.

**Royal Commission on Sewage Disposal.**

THE Commissioners appointed in 1898 to inquire into the various methods of sewage-disposal and to report as to what methods may properly be adopted under different circumstances, have issued a bulky volume containing the evidence collected between June 22, 1898, and May 22, 1901. Among the witnesses whose evidence is here reproduced are government officials, doctors of medicine and of science, chemists, bacteriologists, engineers, solicitors, members of important municipal corporations, patentees, and others. The first and second witnesses were Mr. A. D. Adrian, C.B., Assistant Secretary of the Local Government Board, and Mr. A. Murray of the Local Government Board (Scotland). They were followed by many well-known experts, including Sir Edward Frankland, Sir Henry Roscoe, Dr. Rideal, Dr. Percy Frankland, Dr. Woodhead, Dr. Houston, Dr. Adeney, Colonel Ducat, the late Mr. W. Santo Crimp, Messrs. W. D. Scott Moncrieff, R. A. Tatton, Frank Scudder, Donald Cameron, W. J. Dibdin, Baldwin Latham, C. J. Whittaker, and others. The report contains also a record of visits to Manchester, Leeds, Ripon, and Accrington. The most striking feature of the volume is the large amount of space devoted to the bacterial treatment of sewage in tanks, contact-beds, and filters. Land treatment and chemical precipitation are not neglected, but the Commissioners have evidently determined to make a thorough examination of the most modern methods. That the evidence collected in this volume is in favour of bacteriolysis is proved by the interim Report, based on this evidence, and issued last year, in which the Commissioners said:—"We are satisfied that it is practicable to produce by artificial processes alone, either from sewage or from certain mixtures of sewage and trade refuse . . . . effluents which will not putrefy, which would be classed as good according to ordinary chemical standards, and which might be discharged into a stream without fear of creating a nuisance." We hope to consider the volume of evidence more thoroughly in an early issue.

**Work at the National Physical Laboratory.**

WE were agreeably surprised last Wednesday to find that not only were the alterations which had to be done to Bushey House to fit it up as a laboratory practically complete, but that testing work had actually begun. Dr. Glazebrook and his able staff of assistants deserve every credit for the manner in which the testing-rooms have been fitted up. We noticed an electric furnace which enabled pyrometers to be tested up to 1,200 deg.

Centigrade. The possibility that this opens to manufacturers of being able to measure accurately very high temperatures seems to us to be of great commercial importance. The quality of the work that Dr. Harker has already done in platinum thermometry is a guarantee of the high-class work that will be done in this department. The arrangements of the engineering laboratory are very complete, and accurate tests on pressure gauges, standard screws, &c., which would be quite out of the question in ordinary workshops, can be easily made in it. The electrical laboratory is fitted up with apparatus of the most approved type, and we were glad to see that Mr. Campbell had set up a Kelvin voltmeter with a mirror reflecting a spot of light on to a circular scale as a standard. It seems to us that this forms an almost perfect standard. He has also arranged apparatus for making both elaborate and simple tests on iron for permeability and hysteresis. We were glad to hear that later on Dr. Glazebrook intends to take up the vexed question of standards of light. This question has been causing considerable trouble amongst electricians. The pentane standard, which is the one most generally adopted in this country, needs to be used with the greatest care, and we have found that the marked candle-power of ordinary electric glow lamps is, as a rule, something very different from their real candle-power. The standardising of glow lamps at Bushey House would be a very great help in enabling manufacturers to rate their lamps properly.

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Landlord and Tenant.

THE case of Foulger *v.* Arding (the *Times*, March 13, 1902) is of general interest to landlords and tenants, as it turns on a covenant now to be found in nearly all leases, and about which, in its varying forms, considerable litigation has taken place. The covenant occurred in a lease which contained no repairing covenant by either landlord or tenant, and was in the following terms:—The lessee covenants

"to pay and discharge all taxes rates including sewers main drainage assessments and impositions whatsoever which now are or at any time hereafter during the continuance of the said term hereby granted be taxed rated assessed charged or imposed upon or in respect of the said premises or any part thereof or on the landlord tenant or occupier of the same premises by authority of Parliament or otherwise howsoever (landlords' property tax and tithe only excepted)."

Under Section 4 of the Public Health (London) Act, 1891, a notice had been served on the landlord requiring him to abate a nuisance arising from a defective privy on the premises. The landlord carried out the work, but under the above covenant sued the tenant to recover the amount expended. It was admitted that but for the covenant this charge would be one to fall on the landlord. The Divisional Court found in favour of the tenant, but the Court of Appeal have now reversed this decision, holding the word "impositions" to cover this matter. It was urged on the Court that such a reading would include the case of a building erected beyond the building line and the consequent duty of pulling it down, but the Court met this argument by saying the covenant must be read as embracing only what the parties could reasonably be supposed to have contemplated as within its purview. Both the Court of Appeal and the Divisional Court considered the decided cases as expressing the law on this subject to be very unsatisfactory, and in the present decision the limitation expressed above seems unsatisfactory to us in construing an absolute covenant. The tendency is now to make tenants bear all burdens in respect of the property they lease; and from a consideration of the very numerous cases on the point it appears that, to accomplish this object, in framing this covenant care should be taken to observe three points:—1. To make the covenant indemnify the landlord both in respect of charges placed on the premises and obligations imposed on himself. If this is not done, certain duties imposed by Municipal Authorities as to roads and sewers, which form no part of the premises, may not fall within the covenant. 2. To use wide enough words in laying the burden on the tenant; for instance, a water rate has been held not "imposed" within the meaning of a covenant. 3. To use words wide enough to embrace all rates, duties, and statutory obligations; and for this purpose, as far as can be seen from the decisions, the following seem the most comprehensive words: "rates taxes assessments charges outgoings impositions duties and statutory obligations."

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Lord Rayleigh's Lectures.

LORD RAYLEIGH gave his fifth lecture on "Some Electrical Developments" at the Royal Institution last Saturday. He pointed out that Hertz, whose early death was an almost irreparable loss to science, had completely demonstrated the truth of Maxwell's theory that light was an electrical phenomenon. The invention of the coherer by Branly enabled us to detect electric waves to great distances. He saw no reason for doubting Mr. Marconi's statement that he had sent wireless messages across the Atlantic. Owing to the curvature of the earth there must be a mountain of water about a hundred miles high above the straight line joining the sending and the receiving station. Since Hertzian waves travel in straight lines, and cannot pass through a conducting substance like sea-water, the signals in the ether must be bent round so as to keep on the earth's surface. It could not be a phenomenon of refraction, and it can only be due to diffraction. Taking the wave length of the Marconi waves to be a thousand feet, he calculated that the case was analogous to a luminous spot on a metal sphere one inch in diameter. As in this case the light waves do not appreciably follow the curvature of the ball, he concluded that the curvature of the earth was a very great drawback to wireless telegraphy. It would not do to try and get over this difficulty by making the wave length of the electric waves very long, as in this case they fail to get a hold on the ether, and only feeble signals would be sent. Experiments on electrical resonance were shown, and Lord Rayleigh stated some surprising results he had arrived at theoretically. If there was an alternating-current generating station in one town and a suitable circuit was placed in a neighbouring town, then theoretically it would be possible to obtain as much work from this secondary circuit as the station could give to the first circuit. This is true even when the mutual induction between the two circuits is almost zero. A striking experiment was shown illustrating Hertz's discovery that ultra-violet light considerably diminished the resistance of air to a spark discharge. Lord Rayleigh also showed that when light was concentrated by a quartz lens on a piece of zinc charged with negative electricity the charge was rapidly dissipated. Introducing a thin plate of glass in the path of the light effectively stopped this action, thus proving that it was due to the ultra-violet rays.

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Licensing of Temporary Stands.

IN view of the approaching Coronation processions, the case of The Westminster Corporation *v.* The London County Council, which we reported some time since, should have consideration. The question there decided is, who is the proper authority to licence temporary stands or to inflict penalties for their erection without such licence, since the passing of the London Government Act, 1899, which divided the administrative County of London into separate boroughs. The point arose in connexion with the stands which were erected to view the funeral procession of the late Sovereign. Section 5 of this Act (in connexion with the schedule thereto), from a certain day, fixed by Order in Council as November 9, 1900, removed certain powers vested in the London County Council from that body to the Council of each borough. Among the powers so transferred was the power under Section 84 of the London Building Act, 1894, to license the setting up of wooden structures, and to take proceedings for default in obtaining or in observing the conditions of such licences. Under this Section the Council of the City of Westminster claimed to be the authority to license certain of these structures, whereas the County Council claimed they fell under Sections 82 and 83 of the Act, and that therefore the jurisdiction over them was not transferred. The Divisional Court, constituted of three Judges, has now held such powers in regard to temporary structures made of wood only (except so far as nails are used in the construction) to be transferred to the various Borough Councils. The Court, however, gave no decision on a further point which was raised, as to whether the supervision over these structures has to be exercised by the district surveyors, or whether such duties under the Act of 1894 still fall on the County Council surveyors.

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Unsafe Balconies.

A CORRESPONDENT sends us a photograph of the house in Pembroke-square where, a few days ago, the iron balcony, on which several persons were standing, gave way, and the occupants of it fell into the area below. The stone sill, into which we presume the lower return rails of the balcony were fixed, appears to have broken right away across the whole front of the house, having been very likely cracked by the rusting of the iron. The accident raises serious considerations in regard to the probable danger from insecure balconies during the Coronation procession this year. Many of these iron balconies to ordinary dwelling-houses are probably quite insufficient to bear an unusual crowd of people; they have in many cases been badly fixed to begin with, and their condition perhaps has never been examined since they were fixed. Unless proper precautions are taken we shall be

hearing of some lamentable accidents from the failure of such balconies on houses on the line of route of the procession, and on those in side streets which abut upon it. It is a question whether the District Surveyors ought not to have official instructions to examine balconies on the line of route.

Conway Castle.

IT is stated that Mr. Harold Hughes and Mr. Clarence White, jointly, will prepare designs for the proposed restoration of Queen Eleanor's Tower at Conway Castle. That tower and King Edward's Tower form two of the eight round towers, each with a slender turret or watch-tower, flanking the castle main wall, and guarded the grand entrance on the north-west side. Conway Castle was built in 1284 by Edward I., to command the pass from Penmaenmawr, and after the designs of, it is supposed, Henry de Elreton, "master-mason" of the contemporary castle at Carnarvon. It stands upon a tongue of rock at the south-east apex of the triangle formed by the walls, 1¼ mile in length, encompassing the town. The oblong plan, covering an area of 60 yards by 140 yards, comprises two courts, and an outwork at the remoter end by the river-side. The great hall, 130 ft. by 30 ft., is lighted with six narrow windows opening upon a creek from the Conway River, and three, of a later date, that look upon the ward. Of the eight massive arches which supported the roof, four have remained to our time. On the east side is a small entrance, well protected, and through the rock below are passed, for a distance of 50 ft., the chains of the suspension bridge constructed in 1822 6 by Telford, and on the same principle as that which he followed for the bridge across the Menai Straits. The Parliamentary forces under General Mytton captured the castle in 1646 from Dr. John Williams, Archbishop of York, who had garrisoned it for the King. After the Restoration it was granted to Edward, Earl of Conway, who dismantled the fortress and shipped all its movable materials for the repair of his seat in Ireland. The vessels, however, suffered shipwreck and their cargoes were lost.

The Church of St. Helen, Bishopsgate Within.

ON Friday, March 7, Dr. Tristram, K.C., agreed to grant a faculty of the Consistory Court of London authorising the rector and churchwardens of the united benefices of St. Helen, Bishopsgate, with St. Martin, Outwich, to carry out an improvement in a portion of the churchyard. The alteration will consist of the addition to the narrow roadway leading southwards out of Great St. Helen's of an enclosure on the south side of the church, in the angle of the nave and Holy Ghost Chapel. The enclosure has for some while past constituted a public nuisance in the opinion of the district sanitary inspector, being made a receptacle for all kinds of rubbish, besides forming an obstacle to the turning of vehicular traffic at that spot. The Corporation of London have undertaken to defray all the charges of the improvement, since a sum of only 3,000*l.* was appropriated for restoration and repairs of the fabric after the sale of the site and materials of the church of St. Martin Outwich, Threadneedle-street, and the union in 1873 of the two parishes. Half of that sum was expended ten years ago, when a total amount of 12,000*l.* was spent upon the restoration of the church and the laying-out of the churchyard under the late J. L. Pearson's superintendence. Pearson designed the reredos, and various contributions of money and in kind were made by the Merchant Tailors', Mercers', Grocers', Skinners', and other City companies and by private individuals. The dwarf wall and railings of the enclosure will be replaced with wrought-iron railings to protect the buttress and wall of the church near the south door, attributed to Inigo Jones, of which we published a measured drawing by Mr. J. G. P. Meaden, on August 20, 1898.

The Parish Church, Portsmouth.

WE hear that Mr. T. G. Jackson, R.A., has been called in to advise upon the structural condition of Portsmouth parish church, and to prepare a scheme for the rehabilitation of the fabric which is greatly decayed. The present cruciform church, originally founded in 1173-80 by Richard Toclive, Bishop of Winchester, consists of a Transitional chancel and transepts, a nave and aisles as rebuilt in 1691 in the debased style then in vogue, and a western tower surmounted with a cupola carrying a vane in the shape of a gilded ship, rising to 120 ft., which has formed a familiar landmark to many generations of seamen. The church has a capacity of 1,000 sittings, and contains a cenotaph of George Villiers, Duke of Buckingham and Lord High Admiral, whom Felton stabbed at the Spotted Dog, nearly opposite, in the High-street. The marriage of Charles II. and Katharine of Braganza is recorded in the register.

Institute of Painters in Water-Colours.

A CHANGE has been made in the interior arrangement of the rooms of the Institute of Water colours, a considerable portion of the east room having been thrown into the centre room, the north part of the east room being partitioned off into a small square room. We do not see any advantage in the change for exhibition purposes; the long east room was a particularly good one for hanging pictures, and in place of it we now have a long room running east and west with the wall space broken in the centre by an ornamental column at each side, on the site of the original wall. Architecturally the suite of rooms would have a far better effect if the thing were done thoroughly and the west room also thrown into the centre room with decorative columns; we should then not have the awkward and unmeaning effect of columns projecting into a room in the centre of its long side; and as the alteration has been made so far we recommend that it should be completed. The best things in the present exhibition are not, for the most part, the large and prominent works, but the smaller landscapes and sea-pieces. Various examples of the latter class by Mr. John Reid are all admirable for colour, light, and movement. Mr. David Green's "Returning Fleet" (181) is also a good little sea-piece, and his "Marshlands" (257) and "Showery Weather" (304) equally good in another way, also "Back from the Fishing Grounds" (312). Several small landscapes by Mr. Weedon, especially "Stormy Weather near Sandwich" (474), keep up the traditions of the school of David Cox. Mr. John White's "Sidmouth" and "Branscombe Sea-weeders" (84, 92) are coast studies of special effects of light and colour. Among the larger landscapes those of Mr. Bernard Evans are all powerful in effect, in the rather loaded style which he has evolved for himself; "Across Stainbourn Moor" (292) has a good deal of the style and of the peculiar power also of de Köning. Among other landscapes may be mentioned Mr. Cotman's "Late afternoon—Approach to Canterbury" (20); Mr. Walter Fowler's "Sunny Days" (157); Mr. Orrock's "In Arundel Park" (161), the best of his exhibits; Mr. F. Walton's "Anagown, Loch Maree" (209); and Mr. Leslie Thomson's "A Tidal Creek, Isle of Wight" (232). Among figure-subjects—most of which are very commonplace—the most noteworthy is Mr. Byam Shaw's scene from the opening of "Henry VI.," where the messenger, a soldier in armour, comes in with the bad news from France; this is a fine and remarkable work. Mr. Henry Stock has confined himself on this occasion to portraits, among which the small portrait of "Lady Penrhyn" (188) is a work of great refinement and beauty of colour. Mr. Wetherbee gives us in "The Sleeping Shepherd" (195) a finely-composed idyll of the Golden Age. Among subjects into which architecture enters are Mr. Fulleylove's "Temple of Wingless Victory" (149); Mr. Harry Goodwin's "The Statue Spires of Milan" (250)—the architectural details of the foreground are rather hard and deficient in texture; Mr. Yeend King's street of "Chagford" (350); Mr. Bernard Evans's careful and powerful drawing of part of Fountains Abbey (455), and Mr. W. Collins's "In Bygone Days," in which he paints the buildings of a monastery with figures of monks, but forgets that in the days of the monks the buildings were comparatively new, not ancient and weather-worn. Painters of Mediæval buildings seem unable to realise that they were once new, fresh, and sharp in their mouldings and details, and not as we see them now.

## THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held at No. 9, Conduit-street, Regent-street, W., on Monday evening, Mr. W. Emerson, the President, in the chair.

The minutes having been taken as read,

The Chairman said he regretted very much to have to announce the decease of Sir Richard Temple, one of their hon. members. Sir Richard Temple he had known for many years, and knew that he took the liveliest interest in art and architecture. Sir Richard was a very skilled draughtsman, and he (the Chairman) remembered many years ago in India, when they used to have occasional exhibitions, Sir Richard Temple's water-colour drawings were the admiration of all who saw them. Sir Richard was an exceedingly successful water-colour artist, and he also took considerable interest in architecture. He dined at one of their annual dinners some time ago, and immediately after joined the Institute as an Hon. Fellow. He was sure they all regretted very much to hear of Sir Richard's decease.

Mr. Graham said he had also to announce the decease of Mr. Geo. F. Judge, Fellow of the Institute, who was a constant attendant for many years at their meetings, and was well known to many present. He had further to announce the death of Mr. W. G. Doolin, of Dublin, Fellow, elected 1899.

*The Late Mr. Bentley and the Royal Gold Medal.*

The Chairman said he had at the last meeting a painful incident to mention in connexion with the death of Mr. Bentley, who, had he lived, would have been elected the Gold Medallist. As his decease happened before he was elected, the Council felt that they could not proceed to give the gold medal to the members of the family in consideration of his services, without reference to the King—for it was the

King's gift. Accordingly they wrote to his Majesty, and, in reply, a letter had been received from Sir Dighton Probyn who said that the proposal had received his Majesty's careful consideration, but that his Majesty, while fully appreciating the kindly feelings which had prompted the Council of the Institute to make the suggestion, was of opinion that unless the Council were in any way pledged to award the medal as proposed, or unless it could be shown that a case similar in character had occurred before, it would create a dangerous precedent if the medal for the current year were given to the family of the late Mr. Bentley on the ground that in virtue of that gentleman's great services to architecture, the Council would have recommended him for the medal had he lived until the date of their next meeting. Therefore, that settled the question, much as they would have liked to have honoured Mr. Bentley. The Council at their next meeting, would take into consideration the names of other gentlemen and nominate some one else for the gold medal for this year.

*The Planning of some Recent Library Buildings in the United States.*

Mr. Sidney K. Greenslade then read a paper on "The Planning of some Recent Library Buildings in the United States," of which the following is an abstract :—

In his opening remarks the author said that the development of the library movement in America during the last ten years had been so enormous that few buildings erected previous to 1885 would be found to-day suitable for modern requirements. The librarians themselves have settled points in the policy of the working of libraries which previously were undetermined, and it was the very active interest of these men which had so greatly assisted the architects to produce such very fine plans. Mr. Carnegie's generosity had helped forward the movement wonderfully. Last year alone he gave more than 2,500,000*l.* for new buildings. The result was that the American architect had unequalled opportunities, and was showing the greatest interest in his work. At present some of the recent plans seemed as perfect as possible, yet the interest in the subject was so great that new developments were sure to take place.

The author went on to treat of various representative libraries under the following heads: (1) Reference Libraries; (2) University Libraries; (3) Town Libraries (in three divisions); (4) Branch Libraries; (5) Small Libraries. The planning and general arrangements of the buildings, stack-rooms, furniture, &c., were described in every detail, and illustrated by plans shown by the lantern.

In the first group was placed the Library of Congress at Washington, by far the largest library building in the States, being 470 ft. long by 340 ft. wide, with four great inner courts. The site was acquired in April, 1886, and Messrs. Smitheyer & Pelz's plans were adopted, but no limit of cost was fixed. By the summer of 1888, Congress, dissatisfied with progress made, lodged the entire control of the work, including preparation of new plans, in the hands of General Casey, Chief of Engineers of the United States Army. In March, 1889, Congress enacted that the building should be erected at a total cost of 1,300,000*l.*, including previous expenditure, according to a plan prepared by General Casey. The plan was based on that originally adopted, and the building, under the new conditions, was at once commenced, and finally completed in 1897.

The design for the New York Public Library, now being erected, is the result of two competitions held in 1896 and 1897. In the limited second competition twelve firms of architects were selected from those competing in the preliminary open competition, out of a total of eighty-eight. Tentative sketches of the plans of each floor were issued with the instructions. The assessors (with those elected by the competing architects), Professor Ware, of Columbia University; Dr. Billings, the Librarian; and Mr. Bernard R. Green, of the Congressional Library, finally selected a design which practically adopted the whole of these suggestions. The site allows of an isolated building with ample space for future extension, 455 ft. frontage and 482 ft. to the sides. The cost was not to exceed 340,000*l.* without fittings, but it is estimated now to come to 660,000*l.* Before describing the plan in detail, Mr. Greenslade referred to some interesting and noteworthy points in the conditions of competition. The library will have shelving capacity for 2,000,000 volumes, and seems nearly as perfect a library as possible. Messrs. Carrère & Hastings, of New York, are the architects.

The State Historical Library building at Madison, Wis., is an extremely well-planned building, and forms an ideal reference library. It is to house 675,000 volumes. Architects, Messrs. Ferry & Clas, Milwaukee.

Of University libraries, those of Columbia and New York are particularly worthy of attention. They are not unlike in plan, both in general outline taking the form of a Greek cross. The great central reading-room—in one case octagonal and in the other circular—is the motive of the design in both buildings. Special study-rooms, with their books stacked around them, or near them, are an important feature of both libraries, and in each are treated in a different way. The Columbia University Library is, perhaps, the most monumental of those yet erected in the States. Its magnificent domed reading-room, placed at the intersection of the arms of the cross, is octagonal in form, the four sides at the angles being shorter than the others, and the whole is covered by a great dome. The lighting is from four very large segmental windows following the lines of the main arches to the sides. Architecturally the building is very fine, but it is evident that to obtain it utilitarian points have been somewhat sacrificed. This applies particularly to the storage of books, and the difficulty the staff has in handling them. Its total shelving capacity is 1,050,000 books; the cost was 240,000*l.*; architects, Messrs. McKim, Meade, & White, of New York.

The library of the University of New York (also by Messrs. McKim, Meade, & White), though much smaller than the Columbia University Library, is in some ways more compact in plan. Its domed reading-room is circular on plan, and the books are stacked round about it and not below, and are generally more accessible. Its present shelving capacity is for 250,000 volumes. Shelf-room for 1,000,000 volumes altogether could be obtained by using the large auditorium below the reading-room for stacks.

The library of the Law School at the University of Pennsylvania — a remarkably well arranged and convenient plan — was also described. The architects were Messrs. Cope & Stewardson, of Philadelphia.

Town libraries the author dealt with in three divisions — under Division I. Large Town Libraries, being grouped the Boston Library, Newark Public Library, Providence Public Library, and Washington Public Library. In each of these buildings the motive of the design has been a different one. They all, however, evidence the growth of the free access policy and its great effect upon the plan. Not only is it necessary for the general reading room to have, as in the Bates Hall at Boston, the walls shelved for books of reference, but the borrower must also be allowed shelves to select from. The excellent plan is adopted at Newark of placing open shelf-rooms on either side of the delivery hall, where thousands of books may be stacked. At Providence the shelves are placed between the entrance hall and the delivery space—not so good a method; still, the floor area at this point is so ample that the whole could be re-arranged with advantage. In Newark the stock-rooms are nearly isolated—a great advantage should fire occur in the main building.

The Boston Library (Messrs. McKim, Meade, and White, architects), one of the first great monumental libraries (begun in 1888), was opened in 1895. Architecturally of very high merit, its plan is not good from the librarian's point of view, but the librarians now know pretty well what is wanted, whereas fifteen years ago they were doubtful and uncertain. It is, therefore, unfair to criticise the plan of the Boston Library too hardly, because of the rapid developments since its creation. Still, there are many points in it that are not good, particularly the position of the fine reference reading-room in relation to the stack-room, the cramped position of the delivery hall, and the unfortunate shape and position of the stack-room necessitating the use of carriers. The building cost 473,000*l.*; its present shelving capacity is for 1,50,000 volumes.

The Public Library at Newark (designed by Messrs. Rankin and Kellogg, Philadelphia) was only completed and opened in March, 1901. It is evident that a deal of thought has been spent in its arrangement and planning. A great point has been made of "free access" to the books, both outside and inside the stack. There are some excellent points in the planning of the building. The arrangements for the openshelf rooms, delivery hall, work delivery space, and stack-rooms are very good indeed, and the approach to these rooms from the main entrance is very direct. The cost of the building was 60,000*l.*

The Public Library building, Providence (designed by Messrs. Stone, Carpenter, & Wilson) was completed and opened in March, 1900. The Boston Library, as already stated, from the librarian's point of view, was hardly a success. In the planning of the Providence Library the librarian's advice was invited in the attempt to solve a problem which had not been altogether successfully coped with. An interesting plan resulted. A serious attempt has been made to meet the new requirements of the "free access" policy, and to a large extent it has been successful. The cost of the building was about 53,000*l.*, and the shelving capacity is for 225,000 volumes.

The design for the Washington Public Library building was the result of an open competition. Ten well-known library architects were invited to compete, each receiving an honorarium of 50*l.* Other architects were also allowed to send in schemes, and the result was that the plans of Messrs. Ackerman & Ross, of New York, were selected (not an invited firm). The cost was limited to 50,000*l.*, but this was overstepped considerably, the total estimated cost being 70,000*l.* Building operations were commenced in August, 1900.

At least two distinct types of town libraries occur in the libraries illustrated in Division II. The Atlanta and Davenport represent one and the Pawtucket the other. The latter has only a basement and first floor; the others have an additional floor. At Atlanta the plan is more compact, and therefore more easily worked as a library than the rather monumental plan at Pawtucket. The open-shelf rooms adjoining the stack-room and either side of the delivery space are an excellent feature in the Atlanta library. The Utica library has not been erected yet. It seems to come midway between the above types. All the important rooms are placed on the first floor. Among points worthy of note are the position of reference spaces (10 ft. wide) on each floor of the stack-room; the important position of the children's room, which balances the general reading-room; and the provision for special study rooms. Libraries of this size—average cost 20,000*l.* to 50,000*l.*—are becoming very numerous, and new developments in their planning will always be taking place.

Detailed descriptions were given by Mr. Greenslade of the following town libraries in Division II. :—The Carnegie Library, Atlanta, Georgia (architects, Messrs. Ackerman & Ross, New York); the Carnegie Library, Davenport, Iowa (architect, Mr. W. A. C. Jackson, New York); the Pawtucket Library (architects, Messrs. Crane, Goodhue, & Fergusson, Boston); and the Public Library, Fall River, Mass. (architects, Messrs. Crane, Wentworth, & Goodhue, Boston).

The author next discussed the third division of town libraries. The effect of the "free access" policy is well illustrated in the three libraries selected as examples, viz., the Carnegie Library, East Orange (architects, Messrs. Jardyne, Kent, & Jardyne, New York); the library at Duluth, Min. (architect, Mr. A. Rudolf); and the Public Library, Tacoma, Washington. The tendency to do away with walls and substitute columns with glazed screens between is a failure in all of them. In the East Orange and the Tacoma libraries the use of the radiating stack, the advantages of which were pointed out by the author, is new for a large building.

The system of branch libraries and stations is remarkably organised in many of the large towns. At present few towns have started with a series of new buildings. Old buildings have generally been converted, such as schools, churches, private residences, and shops. The branch library is therefore likely to develop greatly in the near future. It will be most interesting to watch the work of the advisory board of architects appointed to design the sixty-five new branch libraries of New York. Mr. Andrew Carnegie has given 1,000,000*l.* to build these branches, and the Board of Library Trustees have just appointed three firms—viz., Messrs. McKim, Meade, & White, Messrs. Carrère & Hastings, and Messrs. Babb, Cook,

& Willard—to take the entire charge of the designing and supervising of these buildings. These firms will confer and collaborate in the work.

Up to the present time the planning of the branch library has been studied, perhaps, in Pittsburg more successfully than in any other town in America. There are five branches already erected of the seven presented by Mr. Carnegie, each on an isolated site (architects, Messrs. Alden & Harlow). Details were given of the Lawrenceville Branch, opened May, 1898; the West-end Branch, opened January, 1899; the Wylie Avenue Branch, opened June, 1899; the Mount Washington Branch; and the Hazelwood Branch. It is interesting to note the gradual development of the plans. The growth of what may be called the "turnstile control," resulting in the abandonment of the entrances to the reading-rooms from the delivery hall, as adopted on the first plan, is important. The apparent unfitness of the low railing separating the reading-room from the delivery hall, as adopted in the West-end branch, and substituted afterwards by screens in the later plans, is also worthy of note. Although the radial-stack plan is costly to build, yet the advantages where a "free access" policy is adopted are very great.

Finally Mr. Greenslade touched upon small libraries. The requirements of these have been particularly well studied in the State of Massachusetts. Hardly a village or hamlet is without one. Many of those around Boston are extremely successful. It was here that H. H. Richardson erected several of his well-known libraries, such as the Ames Library, at Easton, and those at Woburn and Quincy. The great feature of the plan he generally adopted is the alcoved main reading-room, and in these alcoves all the books were shelved. This method has not been found wholly successful from the readers' point of view, although architecturally the general effect of the alcoves is good.

Many of the recently-erected libraries of this class have very simple and compact plans. The author selected for description the little library at Wayland, Mass. (architects, Messrs. Cabott, Everett, & Mead, Boston); the Russell Library, Plymouth, Mass., by the same architects; and the library at Weston, extremely convenient and well-arranged for its purpose (architect, Mr. Jenny, Boston).

Besides the lantern views, the paper was illustrated by a large number of the original plans and photographs of the most recent library buildings in the United States.

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Professor Beresford Pite said he would like to have the opportunity of proposing a vote of thanks to Mr. Greenslade for the extensive material he had put before them that night, and he thought that in moving the vote of thanks a considerable amount of congratulation was due to the Institute and the Council and the President for the selection of Mr. Greenslade to the Godwin Bursary, because that night they were reaping the benefits of the visit to America which Mr. Greenslade was enabled to take as the holder of that bursary. He thought the material which Mr. Greenslade had brought them was undoubtedly a historical record as well as an illustration of what had actually been done in the matter of the Library movement in the United States. It was something more than a justification as to the use to which that bursary was put, and he could imagine no subject the treatment of which would have given more pleasure to the founder of that bursary than the one which Mr. Greenslade had treated, and the way in which he had read up the subject, taken the tour, and brought back such a variety of useful information connected with what was essentially modern architecture. The object in view was not so much the study of ancient buildings as the study of modern architecture. They were accustomed to study architecture in temples and churches, to get back to the past, and to get from archæology almost all the art to be seen even in the matter of planning. But when they came to books and libraries they found themselves in a progressive atmosphere and in a new field. The enormous originality on this subject, and the extraordinary ingenuity, were qualities with which they always credited their Yankee brethren—the extraordinary ingenuity they displayed in creating buildings for a want which could hardly exist, and for bestowing not only architectural skill and engineering on the buildings, but providing modern appliances for books which do exist and for books which do not exist, and in building for the future in a most original way. This seemed to him most characteristic and remarkable. He would be very glad to hear from Mr. Greenslade whether those bookshelves which were to accommodate millions of books were yet in use—he meant as far as accommodating books went. They would be interested also to have some observations as to the practical use of the very large children's rooms, as well as on the large number of private reading-rooms and students' rooms, which seemed exceedingly numerous. Studying English libraries for the development of public libraries in England, they came across national characteristics and peculiarities which in many respects strongly differed from the things they found in America. He supposed the American was socially more highly organised than the Englishman. For instance, the accommodation provided for the toilet and lavatories, and so forth, which at home had been done away with as they were found to be a public nuisance, seemed to be a matter of great necessity in America. There evidently seemed to be no fear of the library being used for the passing purpose of a conversation or club room, or anything of that sort. There was an atmosphere of serious study about the whole planning and arrangement of the scheme which was very important. He would like to suggest when they were able to see the plans together, ranging from the greatest one to the smallest, that it would be very instructive in itself, apart from the paper, for the dimensions and accommodation and descriptions, as a general survey of the system of planning would be of very great importance and interest. He would like to say that personally he felt they had done a good thing in granting the bursary to a student who had gained honours as an artistic draftsman, and whose work as a designer they all enjoyed, and he had no doubt but that Mr. Greenslade's contribution would be of permanent importance to the Institute. He had much pleasure in moving a vote of thanks to Mr. Greenslade.

Mr. J. H. Quinn, Librarian, Chelsea Library, said he did not know that he could offer anything which would be useful from an architectural point of view on this subject, but as a librarian there was one thing which struck him very much, which was the extreme practicability of the planning, and how everything seemed to lie subservient to economy of administration and to meet the convenience of the public. That was a very important point in library planning, and probably in England it was more important than in America, because in America they did not seem to suffer, as in England, from the meagre funds provided by the public for libraries. In England the want of funds affected them even at the outset in the design of the library. Most libraries were very much cut down in the design and planning by committees, after the original design had been prepared, owing to this question of funds. That did not seem to be the case in many of the examples they had seen that night upon the screen. The Boston library could hardly be regarded as a town library. He thought it would rather be considered a National library, and with some of the other examples they had had it would seem they were State libraries and not town libraries. He was rather struck with one remark made by the lecturer, which was that all the important rooms were put on the first floor, and they would probably like to know why the important rooms were put on the first floor. It was a curious thing that here and in America the loafer would not take the trouble to go up to the first floor and, therefore, libraries were in that way rid of strangers and loafers, and so the rooms were devoted to serious study. Even if they had a reading-room on the first floor the tramp would not take the trouble to climb, and for this reason, and also because of the quietness which was essential for students, they placed these rooms above. He might, as an illustration, give a practical example of how public libraries in England were affected owing to the limit of the rate. In Chelsea, Mr. Brydon planned a very beautiful building—one which, if carried out in its original design, would have been of immense benefit to them, but owing to the want of more money—he believed about 1,000*l*.—they were compelled to cut it down in a way they should not have done. Recently they had missed the late Mr. Brydon very much, but he was glad to say they had had Mr. Leonard Stokes to complete the design as originally prepared. Well, the cost was only some 1,200*l*., but the finding of a small sum like that in a rich borough like Chelsea was a great tax upon the 1d. rate, and such a small sum like that had to be borrowed. He had listened to the paper with much pleasure and expressed his own thanks to Mr. Greenslade, not as an architect, but as a librarian.

Mr. J. O. Smith said he had much pleasure in supporting the vote of thanks. He had very much enjoyed listening to the paper, and thought they all owed a debt of gratitude to Mr. Greenslade for bringing those novel plans before them in the very clear form he had. What struck one in seeing the first large plan on the screen was how the new country had come to the old country for ideas in planning in this new subject. It was new in America, but it was not new in England. It was evident the reading-rooms in the larger libraries shown were based entirely on the British Museum reading-room. With regard to the stack arrangement, the nucleus, at any rate, could be traced to the British Museum. As to the arrangement of the stacks, he gathered from Mr. Greenslade that the borrowers were enabled to come up to them and examine the books on the shelves. It seemed to him that many of the stacks, if they were correctly shown on the plans, would scarcely admit of that, from the fact that there would not be light enough. He gathered that they were 7 ft. high and covered with marble floors through which no light passed, and if they were 30 ft. distant from the windows, he did not see how it was possible for any person to read the books. In London they arranged them so that the books on the stacks could be read. He knew a library not far from where they were sitting where books could be read 30 ft. below the top of the upper tier of the book-stack; but that was top lighted only, and all the passages were gratings through which the light passed. He supposed in the case of some of the libraries they had seen where they were top lighted they also had gratings. Perhaps Mr. Greenslade could tell them about that. It was extremely interesting to note the clever way in which some of the smaller libraries were arranged with a view to getting the maximum of supervision. He thought the circular radiating stacks of books at the back of the librarian's counter were remarkably well arranged for the small libraries. On the whole, it seemed to him that the plans as they became simpler became better. He saw what appeared to him to be many grave defects in some of the larger plans, and he would very much like to see the buildings themselves. He would like to know if Mr. Greenslade could tell them whether artificial light was relied upon to light some of the larger buildings, and also how they are warmed. He supposed being in America they were warmed by steam, and he would like to know the effect upon the books. He had much pleasure in supporting the vote of thanks.

The Chairman said that in putting the vote of thanks he would like to add his expression of congratulation to Mr. Greenslade for the very able way in which he had treated the subject and the amount of work he seemed to have got through during his three months' visit in America. Those buildings were a long distance apart, and Mr. Greenslade was there in the hot weather and must have exerted himself to gain all this information in a temperature from 100 to 106 deg. With regard to Professor Pite's remarks and the casting of a sort of suggestion of doubt as to the exisitence of readers of these libraries, and the storage room for books which did not exist, he would like to say that, whether the readers were there or not, it only seemed to him to prove that this library movement was part and parcel of the great movement the Americans were making in view of the great necessity there was for increased instruction. Some time ago in the papers they would remember there was a correspondence in connexion with the comparative education in Germany, America, and England, and it was pointed out that the Americans and Germans were cutting England out in many trades and businesses simply owing to superior education. He imagined the Americans saw the necessity of this higher education, which was the reason for their working on these lines and starting those libraries, and whether those libraries were full or were not full now, they could depend upon it that before long they would

be full. He should imagine that there were a great many books in these libraries and a great many readers.

The vote of thanks having been agreed to,

Mr. Greenslade said he was afraid that in summing up the paper he had left out some important points. It was very difficult with such a lot of matter to select from to mention all the points of interest, but the paper was to be fully printed in the *Journal*. He could assure Professor Pite that these libraries were used and the stacks were filled with books. [Professor Pite: What books, English?] Mr. Greenslade said he spent many evenings in the Boston Library in the Art Gallery section, and one seemed to be able to get any book one liked. There appeared to be a most remarkable selection, and there were dozens of people using them. At Washington, again, he saw sets of etchings and engravings, and in the Congressional Library there was a whole collection of engravings of Turner's sketches, published between 1830 and 1840. In all the libraries the stacks seemed to be full of the latest books from England, in the way of art books and architectural books. They were displayed on the shelves and one did not trouble the assistant at all. One simply took the book down and looked at it and left it. With regard to the children's rooms, they were simply crowded. The Branch Library at Boston was formerly a chapel, and the whole of the gallery was used for the children's library, and there were hundreds of children there in the evening preparing their lessons. The library provided a series of books, which were used at the various schools in the district, for them to study. In nearly all the libraries there were certain classrooms set apart where teachers brought their scholars, and the librarian placed certain books on certain subjects for reading in those rooms for the children. With regard to Mr. Smith's question as to the light, nearly all the stacks were wonderfully lighted. Of course, in the majority of cases glass was used for the flooring. The pierced cast-iron floor was not used very often, as the dust came through, and librarians did not like it. The Congressional Library was 45 ft. across, and it was quite light.

Mr. Smith: I can understand if glass is used, but I understood you to say it was only marble.

Mr. Greenslade said it was only marble at this library, but it was top-lighted as well. With regard to the heating, that was a large question, but he had touched on that subject in his paper in connexion with the Congressional Library, although he omitted to read it in the course of his address. He thanked them very much for the vote of thanks.

The Chairman announced that the next meeting would be on Monday, April 7, when there would be an election of members, and a paper on "Inlay and Marquetry," by Messrs. W. Aumonier and Heywood Sumner.

## ARTISTIC ELECTRIC ILLUMINATION.

ON Thursday last week, under the auspices of the Society for the Encouragement of the Fine Arts, Mr. Edwin O. Sachs delivered a lecture on "Artistic Electric Illumination," in the galleries of the Royal Society of British Artists. Colonel F. C. Keyser, C.B., chairman of the Council, presided.

Mr. Sachs said the subject he was to talk on was one eminently appropriate at a time when many people were thinking of showing their loyalty at the approaching Coronation festival by illuminating their private residences and business establishments. That was the first time any one had spoken on the decorative side of illuminations, although during his visits abroad he had for many years seen what could be done in the way of artistic illuminations on a large scale, and wondered why no English artist had taken up the subject seriously. He approached the subject first as an architect; secondly as one who had travelled; and thirdly as one who believed that there was a means of employing electricity in an artistic manner for the purpose of decorative illuminations in place of the ugly gas flares. As an architect he looked upon electric illumination as a simple and effective method of outlining public buildings. As a traveller he knew every European capital and many of the minor towns, and, with a few memorable exceptions—notably the Glasgow Exhibition of last year—we were far behind the rest of the world in our attempts at public illuminations. He believed, however, that by the new E. L. B. system of electric lighting, in which he was interested, the difficulties that had hitherto existed of using electricity for illuminations were at last surmounted. The whole question of public illumination was one of very long standing, and any one acquainted with history would know how the great Roman Emperors, and before them the Greeks, and before them the Egyptians, on occasions of great rejoicing, would at night arrange displays of artificial lighting. The application of many small lights at night had from time immemorial been a means of expressing joy. In Russia illuminations had always been much favoured during the last three centuries, and any one coming across old prints would find illustrations showing what was done at the time. First of all there was a small earthenware pan filled with tallow and a wick, and that was the form of illumination that was used for a considerable period. Then came the candle illuminations, which were popular for many, many years. Then came various forms of small lanterns, made of metal, and innumerable paper appliances, called Chinese lanterns. They were quite unsuitable for gas, but were used with considerable effect as a covering for electric light. In Italy water played an important part in illumination appliances, being very often coloured. Another form of illumination appliance, originally intended to be used for oil, was a transparency, the light being placed behind. The most wonderful effect that he had ever seen produced by the application of candles was the celebration of the eightieth birthday of the Emperor William I. at Berlin, where, by special arrangement, the entire city of Berlin placed six or eight candles on the lower sill of every window. He considered that that simple but well organised effect was probably the grandest illumination that had been produced for many a year. But what would have been the effect if, instead of candles, they had used lines of small incandescent electric lights, running along the corners and fronts of the houses, or perhaps three or four rows! He should say that probably that would be the grandest form of illumination that could be given to any city. Reverting to gas, they had first of all plain pieces of gas-piping, with little holes bored at intervals. That was largely used for the outlining of buildings, and was very effective, especially if simple designs were adhered to. So long as one kept to plain devices a good effect might be obtained, but it must only be used for the very simplest form of illumination. The next form of gas outlining was a development by the application of a small burner, which did not, however, to any great extent improve matters. The next stage was the application of a small gas globe above the burner, the glass globe frequently being coloured. By that means gas could be made an effective illuminant as long as only plain, straight work was required, but immediately decorative devices were used he did not consider the results good; in fact, they were most tawdry. Lastly, as far as gas was concerned, came the very popular application of ordinary gas-jets behind crystal emblems, and under certain conditions the result might be made highly artistic, but the moment simplicity was left for complicated design they got bad results.

The lecturer then described the illuminations which he saw on the night of the King's birthday in the main thoroughfares of the West End, and said that for the most part he found most of the principal buildings were in darkness with the exception of a few "E. R.'s," stars and badges. Gas was the principal illuminant; in fact, he only came across four or five electrical devices, and those of rather an insignificant kind. He very much doubted whether the coming Coronation would give us any systematic attempt in the way of public illumination. The only street in London that went in for doing the thing on a systematic arrangement was St. James's-street, and he was afraid that even there they were rather apt to go in for the tawdry. On looking into the question he had found that the people of London were rather conservative and did not like to leave gas for the electric light, and secondly, the electric light companies in London did not quite seem to have grasped the possibilities by which they could make money by inducing their customers to illuminate by electricity instead of gas. There was a certain amount of prejudice against electric light for illumination devices, and that, perhaps, accounted for its being such a rarity on occasions of that kind, although one could get a far better effect from it than from anything else. It must be remembered that the illuminations on the King's birthday were trivial in the extreme to the illuminations one would find in connexion with a similar event in a foreign country or even in our own colonies, where electric light had already been used with very great effect. Their friends in Scotland at the Glasgow Exhibition showed what splendid results could be obtained from the use of electricity in outlining some of the buildings, and when the Duke and Duchess of York visited Australia and Canada, both countries did a good deal in the way of electrical illuminations, particularly Canada, which had probably learned a lesson from the United States, and nearly all the great public buildings of Canada were outlined with electric lights on that occasion. The great difficulty, of course, in outlining buildings with electric light in London was the question of cost and the necessity that had hitherto existed of having to adhere to straight lines. The British workman was a very expensive individual, and more particularly so when he called himself a mechanic and an electric wireman. That difficulty, however, had been got over by the new E.L.B. system, which allowed of practically every householder doing his own electric wiring, and he could move the lights about at will. A further advantage of the new system was that one was not confined to straight lines. They could have curves for encircling columns, they could festoon or form garlands—in fact, any form of device could be arranged at a moment's notice. The lecturer before concluding remarked that no matter how artistic the illumination might be, it was often spoiled, because ugly flaring colours were used as a background, and he dwelt upon the importance which a proper coloured background had in producing a really artistic effect.

On the proposition of Mr. Henry Hewkley, seconded by Mr. Philip H. Newman, Hon. Sec. and Treasurer, a cordial vote of thanks was accorded Mr. Sachs for his lecture.

## CARPENTERS' HALL LECTURES:

### EXETER CATHEDRAL.

ON Thursday, last week, Professor T. Roger Smith delivered the fourth of the course of lectures on matters connected with building, arranged by the Worshipful Company of Carpenters, at Carpenters' Hall, his subject being "Exeter Cathedral."

Professor Roger Smith said the ancient Devonshire church buildings had their most marked distinction in their rich carving. It was a county where ornament was to be found in profusion in the parish church as well as on the hill side, and it was therefore only consistent that the Cathedral of Devon should be erected in a style which more than any other demanded, nay, required enrichment. Exeter Cathedral was not one of the three or four cathedrals whose admirers could strive for the honour of its being reckoned the first in England, but it was not necessary to limit themselves to a first-class cathedral in their search for architectural beauty and features of interest. A Saxon church stood at Exeter in the seventh century, and occupied some part of the site of the present cathedral, but it had been superseded by more modern buildings, and had left no trace that can be recognised. The commencement of the oldest part of the present structure dates from the year 1111, and belongs to a complete Norman church begun at that date, and so far as they knew carried on during the whole twelfth century. The erection of this great church was part of the policy of the Conqueror and his successors, whose aim seems to have been to erect castles, churches, and cathedrals all over the land. The only portions of the old Norman church now remaining are two low massive towers. Everything else has been either modernised according to the idea prevalent in the fourteenth century or pulled down and rebuilt at that time and later. With the exception of the two towers the cathedral belongs entirely to the decorated or the fourteenth century period. Parts of it were done early in the century and parts later on, but there is a great degree of harmony from end to end. In its window tracery, its carving, and its vaulting—three of the matters which are most ornamental—Exeter is almost unrivalled. Its architects have relieved what

would otherwise be but a dull exterior by a finely imagined series of statues in niches at the west front, and if the execution is a little rude there is no doubt that the general effect is one of richness. Exeter Cathedral is, however, far finer inside than out—a peculiarity of which no wise critic will complain. It was infinitely better that the expectations raised by the exterior should be surpassed by the interior, than that it should disappoint them. The cathedral was built in the style current in the fourteenth century, which was hardly illustrated at all by the Westminster Cathedral, and while, on the one hand, it was deficient in specimens of Early English, which is dominant at Westminster, and of Perpendicular, which is the style of Henry VII.'s Chapel, on the other hand, it retains two fine pieces of Norman architecture of which there are only traces at Westminster. Again, in proportions the two interiors differ. Those at Westminster are lofty to an unusual degree, and the actual height is very great. The proportions of Exeter are comparatively low and the actual height moderate. Moreover, this lowness of proportion extends to most of the windows, arches, &c., and results in a great deal of harmony and dignity. In one respect Exeter differs from almost every cathedral. It has no central tower, but in exchange it has two towers at its sides standing about midway between the east and the west ends. As a result there is outside a long level main roof with no break in it, which if it be dignified is also dull. Inside, the towers not only form transepts, but they affect the interior in another way—they render unnecessary the great piers which are usually seen at the crossing and upon which the central tower rests, and the absence of these piers lets the eye travel very freely from end to end of the cathedral. The plan of Exeter Cathedral is very regular. It has a central avenue and side aisles extending from west to east, both very little broken at the transept, which stands midway. The transept occupying as it does the two towers, there are no transept aisles. There is the usual English secondary transept further east, and the English square east end. Beyond there is a lady chapel. A rectangular chapter house stands south of the south transept. Under the shelter of this transept formerly existed a cloister, which was destroyed in Cromwell's time. Some traces of this cloister, not now perceptible, appeared in Curtis's ground plan dated 1797, republished in the *Builder* of June 6, 1891. In the same number appeared a fine view of the exterior by Mr. Needham Wilson. The long spacious choir was enclosed in the usual position, east of the crossing. At the entrance to the choir is a screen carrying the organ. This position is not now occupied by the organ in many cathedral churches, but it was once customary, and in this instance the effect is very fine. There is an unusually marked love of symmetry in the plan. The large buttresses were rendered necessary by the vaulting of the whole interior. A very large amount of window opening exists. Many of these windows are low, but they are very wide; as a result, the interior is full of light. There are no western towers, and, as a consequence, there is neither a baptistry nor a morning chapel. The architect who designed the west front deserves credit for having accepted the conditions and having made a front which suits an interior of low, broad proportions and which is quite complete without towers. There are three main divisions or stories—a topmost gable kept back a little and pierced by a window, a middle story, and a third and lowest story. There are three entrances, poor and small, as is usual with English cathedrals, but in a fine setting of tabernacle work and sculpture. On examining the north side of the cathedral one is struck by the boldness of the buttresses and the richness and variety of the windows, which occupy so much of the wall space between them. They are all flying buttresses. It is instructive to compare the windows of the nave of Exeter, completed about 1350, with those of the Eastern part of Westminster, and especially of the Chapter House, dating exactly 100 years earlier. The change which had come over architecture during the century could be well appreciated by making the comparison. The Westminster windows are of comparatively tall proportion, and have in the head a moderate amount of tracery, very severe and simple. Many of them are divided into two lights only, and where there are more lights the whole treatment is by geometrical forms alone, and the general effect one of restraint and severity. The Exeter windows are of totally different proportion—wide and low, the arched head far more sharply pointed, the windows divided into a far greater number of lights, and the head occupied by a mass of intricate and varied tracery far more florid and ornate, admitting lines of varying curvature and forms, many of which are widely different from the geometrical shapes in the Westminster window-heads. These windows follow the same rule of making one side of the building correspond to the other. There are said to be forty varieties of window tracery in the Cathedral. The great west window is a fine example of this class of tracery window, but not so fine as the east window of Carlisle Cathedral. The two towers are very unusual, both in themselves and in their position. They are between 100 and 150 years older than the bulk of the remaining building, and they look it. The lower part of them is quite plain, but the upper part is divided into four stories of arcades, partly blind and partly pierced by openings. Proceeding to deal with the interior, Professor Smith said that few could enter it without being profoundly impressed. The whole interior is vaulted, and all in one manner, and that quite in keeping with the rest of the architecture. The proportions are dignified, but not lofty. There is, however, a sense of harmonious correspondence between one and another feature, and there is a flood of light. The proportions are unquestionably the key to much of the dignity of the interior. Those of the nave are, broadly speaking, in double square. It had, however, been necessary to sacrifice a good deal of the dignity of one feature—the triforium. In Exeter the arcade is of fine and dignified design, and sufficiently lofty to be impressive, but the triforium is as low and inconspicuous as it is possible for it to be, while the clearstory—thanks to the alteration in the shape of the windows, which had now come about—is also very low. Both these stories are much blended with the vaulting, which is as closely combined as possible with the clearstory windows. The vault is at a stage of development which is most favourable to effect, and it is doubtful if any more successful vaulted structure exists than this. The vault was executed at the same time as the lower parts of the building, which does not always happen to be the case. Hence the whole is perfectly in harmony, and the grand shapes of the different divisions impress the eye without perplexing it. The views looking east and west give opportunities of examining the great windows which close up each end of the fine vistas. A feature of the nave which catches the eye is the minstrel gallery, an extremely rich projecting gallery with twelve niches laden with ornament, and each occupied by a musician playing on a quaint instrument. Among the points of interest in the interior are the lady chapel, parts of the choir, and the transept. In the north transept is one of the largest bells in England, weighing 12,500 lbs. During the Commonwealth a brick wall was built across the cathedral at or near the choir screen, and two preachers occupied "West St. Peter's" and "East St. Peter's." On the Restoration they were expelled by Bishop Ward, who pulled down the wall. Professor Smith proceeded to describe the principal features of the lady chapel: Speke's Chantry, Oldham's Chantry, and Sylke's Chantry, and the Chapel of St. Paul, and remarked that the cathedral is rather rich in small chapels and chantries. He dealt at some length with the beautiful specimens of carving which are to be found in the cathedral, and produced a miserere 700 years old, taken from the cathedral, which he said they all would like to see replaced. In conclusion, he said that in this venerable and somewhat unconventional structure we had a building full of interest, and with a great deal of architectural beauty to repay the trouble of searching for it.

The address was illustrated by a series of new photographs. The miserere was lent by Mr. Harry Hems. At the close a vote of thanks was accorded Professor Smith on the motion of the Master of the Carpenters' Company.

LONDON MASTER BUILDERS' ASSOCIATION.—The following officers of the London Master Builders' Association were recently elected for 1902-3:—President, Mr. G. J. Lough (Messrs. Stimpson & Co.); senior vice-president, Mr. E. J. Brown (Messrs. Brown, Son, & Blomfield); junior vice-president, Mr. A. W. Spencer (Messrs. Spencer, Santo, & Co.); hon. treasurer, Mr. J. Carmichael.

## THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

### III.—PREMISES, KENSINGTON.

THE third spring visit of the session was made on March 8 to Messrs. Derry & Toms' premises in Kensington High-street. Mr. F. E. Williams, the architect, kindly met the members, and briefly described some of the difficulties which had to be met and overcome, and which were largely responsible for the ultimate form which the additions have taken.

The chief factors were the absolute necessity for abundance of light and as much uninterrupted floor space as possible for the new showrooms and workshop. The additions are at the rear of Tudor House, in the High-street, and as the existing show and workrooms were largely lighted from the back, it was an exceedingly difficult problem how best to deal with the new premises without interfering with the light of the old. This has been overcome in an able manner by means of a domed building, the upper part, some 28 ft. in diameter, being covered by a light iron framed skylight. The value of floor space made it imperative practically to carry nearly the whole weight upon iron stanchions. These have been arranged in four pairs, with a girder over each pair. These girders receive four girders placed diagonally, upon which the dome rises; the pendentives being formed in concrete upon wooden centering.

An oval-shaped cantilevered balcony forms the first floor gallery, and the whole building will be amply lighted by the glass dome and four large semicircular windows. The necessity of keeping the various sections within the 250,000 cubic ft. prescribed by the Building Act limited the area of the dome section to this amount, the portion under the dome being, of course, cut off from the other parts of the building by the usual iron doors.

The dome is crowned by a cupola, in which is placed an electric exhaust fan; and the greatest attention has been paid to the glass roof to afford every facility for cleaning and for the escape of condensation. From the ground floor to the crown of the dome is 56 ft. The new workroom for about seventy girls is splendidly lighted, and, in fact, every care seems to have been taken by Messrs. Derry & Toms and the architect that the conditions of labour for their workpeople shall be the healthiest and best possible.

The oval first-floor gallery will be finished by a bright polished steel railing surmounted by a copper rail. The copper has been electrotyped on to a wood core, which is believed to be an entirely novel treatment. The stanchions on the first floor will be cased with marble, the caps being plaster copper electrotyped. The ground floor columns will be cased in plaster. The building is at present hardly sufficiently advanced for an opinion to be formed of its artistic merits, but it is certainly a good example of the multitudinous difficulties which an architect is called upon to overcome successfully in a commercial building at the present day.

The proprietors kindly provided tea for the members, and a hearty vote of thanks to them and to Mr. Williams for his trouble brought a successful visit to a close.

## THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

THE eleventh meeting of the Discussion Section for this session was held at 56, Great Marlborough-street, W., on the 14th inst., Mr. R. H. Weymouth presiding. The minutes of the previous meeting having been duly read and confirmed, the Chairman read the list of nominations for the ensuing session, as follows, viz.:—Chairman, Mr. Geo. H. Smith; vice-chairman, Mr. J. H. Pearson; hon. secs., Mr. H. Gregory Collins, Mr. E. W. Wonnacott; ordinary members of committee, Mr. F. C. Eden, Mr. W. A. Forsyth, Mr. Geoffry Lucas, Mr. Louis Ambler.

The Chairman then called upon Mr. H. C. Lander to read a paper entitled "Co-operative Homes." As might be gathered from the title of his paper, the author dealt with the question from a socialistic, rather than an architectural, point of view. Several sets of plans were exhibited and explained by Mr. Lander, but the schemes had not been carried out. It was much regretted that the author was obliged to leave early in the discussion.

Mr. Louis Ambler, in proposing a hearty vote of thanks to the author for his very able paper, said it was not clear to him whether the author meant to apply the co-operative idea to the working classes only. Mr. Lander's paper had given them much food for thought, but in his (Mr. Ambler's) opinion it was an unworkable idea.

The vote of thanks was seconded by Mr. W. Bonner Hopkins, and, having been put to the meeting, was carried unanimously.

The following gentlemen then took part in the discussion, viz.:—Messrs. Sedgwick, J. H. Pearson, H. P. G. Maule, F. Lishman, Jenkins Powell, R. H. Weymouth, and McClay.

It was announced that the next meeting would be held on Friday, April 18, when Mr. A. Needham Wilson will read a paper on "A Tour in the South of France."

## MAGNETISM IN TRANSITU.

ON Friday evening of last week Professor Silvanus Thompson gave a lecture at the Royal Institution on "Magnetism in Transitu." He began by pointing out that a permanent magnet loses none of its magnetism when it magnetises a piece of iron. The problem of how magnetism is transferred from one body to another has been studied for hundreds of years. Gilbert, in his book "De Magnete," discussed this problem, and was led to compare magnetism with light. He discovered that if a piece of loadstone is capped by a piece of iron it acts more strongly. The lecturer illustrated this by showing a loadstone which, although by itself unable to lift a nail easily, did so when a piece of iron was put on the other side of it. To illustrate how iron conducts magnetism, a compass needle was placed 3 ft. away from a loadstone, and it was shown that the latter had no effect on the former. When, however, a soft iron rod, 3 ft. long, was placed between the two, the needle was at once deflected.

To show the effect of an electric current on a magnetic field, a horizontal plate of glass with a hole in the centre through which passed the vertical wire carrying the current was sprinkled with iron filings. When the current was turned on, and the plate gently tapped, the filings arranged themselves in approximately circular curves round the wire. Professor Thompson said that magnetism consisted in bringing the molecules of iron into alignment, each molecule being itself a magnet, and all of them consequently pointing the same way when a strong magnetising force was applied to the iron. He illustrated this by showing how Ewing's model magnet made up of a large number of small compass needles behaved when subjected to magnetising forces.

A striking experiment was shown to illustrate the great force that can sometimes be called into play by magnetism. A small iron cup weighing about 3 lbs. had a keeper weighing about 6 ozs. When the cup was magnetised the attraction between them was so great that they could not be easily separated, and the lecturer said that the keeper could support a weight of 300 lbs.

Animated photographs were shown on the screen illustrating the growth of the lines of force round a wire carrying an electric current, and also showing the behaviour of the lines of a force between a horse-shoe magnet and its keeper as the latter was put on and taken off. In the former case the lines of force converged into the keeper, and in the latter they diverged from it. The lecturer pointed out that it was possible to tie lines of force into a knot. In conclusion he laid emphasis on the fact that lines of force always spread sideways, and that magnetic forces were always propagated in a lateral direction.

A CONSTANT HOT-WATER SUPPLY.—An apparatus designed to provide a building throughout with a constant and unlimited supply of hot water is manufactured by Maughan's Patent Geyser Co., of Holywell-row, Worship-street, London, and is known as the "Teba Auto-Geyser." The opening of any hot-water tap in the building draws hot water from the geyser. Fresh cold water then enters the geyser through a ball valve. At the same moment a float is lifted and turns on the gas. When the hot-water tap is closed the geyser again fills, and the ball valve automatically cuts off the gas. A pilot light serves to maintain the temperature of the water in the geyser, and to relight the main burner every time hot water is drawn from the geyser.

## *ARCHITECTURAL SOCIETIES.*

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The ordinary monthly meeting of the Sheffield Society of Architects and Surveyors was held in the lecture-hall of the Literary and Philosophical Society, Leopold-street, on the 13th inst., Mr. T. Winder presiding. Several gentlemen were nominated for membership, and Mr. H. C. Brameld was elected an associate. Messrs. W. J. Hale and W. Potts were elected auditors. The City Council having agreed to the nomination of a member from the Society to sit upon the School of Art Committee, Mr. E. M. Gibbs was chosen as representative of the Society. A vote of thanks was given to Mr. A. H. Holland for his kindness in letting the Society have the use of the Howard Art Gallery for the recent exhibition of the Royal Institute of British Architects' prize drawings. Mr. F. W. Troup, of London, then gave a lecture on "Leadwork." The following is a summary of Mr. Troup's paper:—"Few people realise to what extent lead was formerly used in the art of building. The ease with which the metal could be reduced from the ore made its use possible with the rudest of appliances. Once reduced to the metallic state it is one of the most imperishable of the metals. It is at the same time the easiest of them all to melt, to cast, or to fashion into various shapes either in the molten or solid state. This country has always been famous for its lead. A French writer of the seventeenth century says:—'The greater part of what we get here comes from England in large ingots called "samnous," weighing 400 lb. or thereby. Germany also sends us some lead, which is in square "samnous" of 120 lb. weight, but the latter is short and less pure than that from England.' Again, Harrison, in his 'Description of England,' says:—'There were mines of lead sometimes also in Wales which endured so long till the people had consumed all their wood by the melting of the same.' We find examples of lead having been used in Babylon, in Egypt, in Greece, and extensively in Roman times. There are many examples of Roman coffins and cists and ingots in the various museums. In the crypts of St. Paul's Cathedral I have seen Roman water-pipes stacked in heaps of old lead. This is kept to be melted down when required for new sheathing for the dome or other parts of the roof. I do not suppose that in this year of grace, 1902, a Roman water-pipe would be sacrificed in the melting pot, even of St. Paul's Cathedral, but that was the obvious intent when the pipes were stacked there. Doubtless many have ere now been melted up, and that which once conveyed water to Roman London now conveys the rain water from the dome to the drains of the Cathedral. In mediæval times lead was used for covering the roofs of the finest buildings, also for covering and decorating spires of churches and cathedrals. The London churches particularly were noted for their fine lead covered spires, chiefest of them all, that on old St. Paul's. Stow says this was 520 ft. high—260 ft. stone and 260 ft. lead covered spire. It was burned down in 1561, a century before the Great Fire of London. Much earlier than this, in 1090, we find (as quoted by Mr. Lethaby) the Bishop of Coutances in Normandy sending to England for Brisenetus, the plumber, to make afresh the leadwork for the roofs and tower. Numerous though the examples of English leadwork in church and palace were, and still are, I doubt if we have left to us quite such gorgeous examples as are to be found in some of the French roofs, spires, and fleches. But I have touched on examples enough to show how much esteemed lead was for practical use in the Middle Ages, and how well the plumbers rose to the occasion, displaying their leadwork so that it held its own with any of the materials used in the greatest of their masterpieces. Yet with all this, the work was often all done on the site of the building. No elaborate machinery or complicated tools were needed. The plant consisted of a frame some 4 ft. to 6 ft. wide, and 12 ft. or more long, on which a sand bed could be laid. Besides this little more was wanted, except a pot in which to melt the lead. The molten metal was flooded over the levelled bed of sand, and from the sheet so cast everything could be wrought, bossed, and beaten up, whether it were a flat sheet for roofing or a crocket on a spire or a lead-covered angel on a pinnacle. Various parts were cast in the same sand bed by imprinting moulds or patterns and running the molten lead into them, but the great mass of the work was beaten up from the flat sheet, and the great art of the plumber consisted in fixing, laying, or hanging his lead in such a way as to cover and protect the roof or spire from wet, and yet keep his soft and ductile metal from slipping or dragging itself off. If care were taken that the sheets should not tear or crack by the contraction of the metal at night after being beaten on by a hot summer sun, there was no reason why the material should not last for ever, none, at least, except fire, from which no material is safe that rests on a wooden substructure. Gradually the use of lead for anything but the most utilitarian purposes died out, and now 'plumber' and 'sanitary engineer' are almost convertible terms. The 'lead-work' of a building conjures up pipe casings or the grand display of sanitary waste-pipes, overflows, and ventilators, culminating in the inevitable cowl that tells of modern sanitation. There is, however, no reason why lead should not be restored to its ancient prestige and be used once more as a pleasant and sightly material, and one on which the workman can display his fancy and lavish his labour of love." On the motion of Mr. Paterson, seconded by Mr. W. J. Hale, and supported by Messrs. W. C. Fenton, T. Winder, and others, a hearty vote of thanks was accorded to the lecturer.

MANCHESTER SOCIETY OF ARCHITECTS.—The last meeting of the winter session was held on the 13th inst. in the Chamber of Commerce, Mosley-street. Prizes for the work of the past session were presented by the President, Mr. Darbyshire, to the successful students, whose drawings, together with those of their competitors, were hung round the room. The President announced the names of the prize-winners in the Class of Design for February, for which the subject was a "Gatehouse to a Public Institution." In the senior class, Mr. J. T. W. Brooke took the prize, and in the junior, Mr. G. F. Ely, while special second prizes were awarded to Mr. Claude Paterson and Mr. Harold Hill. The winner of the prize offered by Mr. John Holden for the design for a public art gallery was Mr. Percy A. Horrocks. Mr. Isaac Taylor then gave a criticism on the drawings submitted, of which over fifty were exhibited. He congratulated the Society on the high standard of, and increased interest taken in, the students' work. He discussed the drawings one by one and pointed out the merits and defects of each design. Besides the four prize designs for a gatehouse above mentioned, Mr. T. F. Shepheard's bandstand, and Mr. C. Paterson's shopfront were picked out as particularly good, both in design and in drawing. The drawings are to be exhibited next week at the Bury Technical School.

NORTHERN ARCHITECTURAL ASSOCIATION.—The annual meeting of the Northern Architectural Association was held on the 12th inst., the President (Mr. Frank Caws, of Sunderland) being in the chair. The meeting was held in the Building Trade Exchange, Northumberland-street, where in one of the rooms the students' drawings were exhibited. The annual report, which was read by Mr. Arthur B. Plummer (hon. secretary), recorded the increasing success of the educational work of the Association. Since the last annual meeting four members, three associates, and twenty students had been elected, and the roll now stood as follows:—Members, 57; associates, 74; students, 80, making a total of 211. The Council again desired to recommend the Architects' Benevolent Society to the members as worthy of support. The financial statement showed that the balance in hand was 38*l.* 19*s.* and that the Association had 50*l.* invested. Mr. H. C. Charlewood presented the librarian's report, 201 volumes having been issued to the students. Mr. Plummer read the report of the secretary of the Students' Sketching Club. The Chairman commented on the great fulness of the work done as shown by the reports, and he did not think that they could adopt them without expressing a warm feeling of indebtedness and gratitude towards their energetic honorary secretary. The reports were adopted on the motion of Mr. Badenoch, seconded by Mr. Dyson. The elections resulted as follows:—President, Mr. F. Caws; Mr. J. W. Taylor, vice-president; Mr. A. B. Plummer, hon. secretary; Mr. J. T. Cackett, hon. treasurer; Mr. H. C. Charlewood, hon. librarian; Messrs. H. G. Badenoch, J. Bruce, R. B. Dick, J. W. Donald, and T. Reay, were elected as the

Council, and Mr. H. Oswald and Mr. R. P. S. Twizel were appointed associates. Prizes were then presented by the President to the successful students.

## THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. J. M'Dougall, Chairman, presiding.

*Loans.*—On the recommendation of the Finance Committee, it was agreed to lend Fulham Borough Council 10,720*l.* for purchase of land; Lewisham Borough Council 5,335*l.* for the acquisition of land for an open space; Poplar Borough Council, 15,400*l.* for electric light installation; Islington Borough Council, 10,438*l.* for electric light installation; Stepney Borough Council, 8,010*l.* for paving works, and 3,530*l.* for asphalte paving; Kensington Borough Council, 11,745*l.* for public convenience, paving works, Town-hall extension, and street lighting; St. Marylebone Borough Council, 3,400*l.* for underground convenience; St. Olave's Guardians, 16,000*l.* for erection of cottage homes for children; and the Asylums Board 24,000*l.* for additional accommodation for smallpox patients.

*The Works Department.*—The General Purposes Committee submitted the following report:—

"In our report of February 3 last, we stated that we proposed in due course to submit for the Council's consideration a draft order of reference to the Works Committee. We have carefully considered the matter and now desire to ask the Council to adopt the order of reference which we present with this report.

We should explain that the order of reference is practically an embodiment of existing standing orders, the 'Works Committee' having been substituted for the 'Finance Committee,' the 'Executive Committee' or the 'Works manager,' as the case may be, and the only new provision of importance is rule 6, under the terms of which it is suggested that in the event of it appearing to the Works Committee that the cost of a work will exceed the amount authorised by the Council, the Works Committee shall inform the Council of the fact.

It is necessary that other standing orders relating to the execution of works by the Works Department should be amended by the substitution where necessary of the words 'Works Committee,' and we accordingly submit these standing orders as revised, and would ask the Council to rescind the present standing orders affected.

The concluding paragraphs of standing order No. 202 provide that the principle of the arbitration clause inserted in the Council's building contracts shall be applicable to the settlement of any questions that may arise between officers of the Works Department and the certifying officers of the Council, and the last paragraph of the standing order is as follows:—

For the purpose of applying the above principle the points of final difference between the officers of the Works Department and the certifying officers are to be reported to the General Purposes Committee, and that Committee shall be empowered to give the necessary authority for the points in dispute to go to arbitration, and to appoint an arbitrator after receiving agreed nominations from the officers of the Works Department and the certifying officers.

We consider that this method of applying the principle referred to is inconvenient, and we are accordingly suggesting in recommendation (*d*) an amendment of the last paragraph of the standing order in question. We recommend—

(*a*) That the following be the order of reference to the Works Committee:—

The Committee shall consist of seven members.

The Committee shall, unless in any case otherwise ordered, carry into execution all works which the Council resolves to execute without the intervention of a contractor; and shall also, unless in any case otherwise ordered, carry out jobbing works and repairs, including the work of the erection of hoardings, fans, and shoring.

The Committee shall consider and report upon all questions relating to the appointment, pay, duties, promotion, or dismissal of all officials on yearly salaries in the Works department. The employment and control of all officials on weekly wages (with the exception of the staff of the Works accountant), and of all foremen, timekeepers, workmen and persons of a like class, shall devolve upon the manager.

The Committee shall present quarterly reports to the Council as to the estimated expenditure on maintenance account during the ensuing three months in respect of the equipment and maintenance of all workshops and yards used by the Works department, and the provision of plant, machinery, horses, and materials or other things for stock. On the sanction of the Council being given to such expenditure, the Works Committee shall have power to expend money for such purposes up to the amount sanctioned, and to enter into contracts therefor on behalf of the Council. All expenditure on capital account shall be subject to the usual procedure of the Council as regards such expenditure.

When the Council shall have resolved that any work shall be carried out by the Works Committee, and shall have passed the necessary estimate of the cost of such work (hereinafter called the 'accepted estimate'), the Committee shall have power to enter into any contract on behalf of the Council and to incur any expenditure necessary for the carrying out of the work within the limit of such accepted estimate.

The Committee may execute any works referred to it by a Committee of the Council, provided that the cost of each work is under 50*l.*, and in the case of emergency may execute any works which a Committee of the Council or an officer of the Council is entitled in such case to order to be executed.

The following rules shall be observed by the Committee:—

1. The Committee shall keep separate accounts in such a manner as to show the cost of each work executed.

2. The actual cost and final estimate of a work shall be ascertained as soon as possible after the completion of the work.

3. Statements showing the estimated and actual cost of the works completed up to September 30 and March 31 shall be presented by the Works Committee to the Council within three months of the aforesaid dates. Fourteen days before such statements are laid before the Council the account for each work shall be sent by the Works Committee to the Committee on whose behalf the work shall have been carried out, and any report which such Committee may desire to make shall be brought up to the Council at the same time as the statement submitted by the Works Committee.

4. Such statements shall show (*a*) the amount of the accepted estimate, (*b*) the amount of the final estimate if the work has been varied by reason of certified additions or deductions, and (*c*) the amount of the certified actual cost of each work executed.

5. In the case of jobbing works, which for this purpose are defined to be works in respect of which bills of quantities, complete specifications, and drawings have not been supplied, the accounts shall show (*a*) the schedule value ascertained in accordance with the schedule of prices, and (*b*) the certified actual cost, and shall be presented to the executive committees concerned from time to time as the works are completed, the totals being subsequently reported by the Works Committee to the Council at the same time as the statements referred to in Clause 3.

6. Whenever the Works Committee are satisfied that the expenditure on any work of which the accepted estimate is over 1,000*l.* will exceed the amount voted for that work, the Committee shall report the fact to the Council when submitting the next half-yearly statement referred to in Clause 3.

7. In the case of any work the actual cost of which has exceeded the accepted estimate, the Works Committee shall obtain the approval of the Council to the amount of the excess.

(*b*) That the following be standing orders of the Council:—

*General.*

Any Committee contemplating the execution of any work shall, before coming to a decision as to how the work should be carried out, obtain an estimate from the proper officer. If the Committee on receiving the estimate, shall decide to recommend the Council to have the work carried out without the intervention of a contractor, they shall, before reporting to the Council, refer such estimate, together with full plans and specifications, to the Works Committee for consideration. If the Works Committee express their willingness to carry out the work at the amount of such estimate, the Executive Committee shall thereupon take up a recommendation to the Council, at the same time submitting the full plans, specifications, and estimate of the proposed work, and such estimate, if approved by the Council, shall be called the 'accepted estimate.'

When a work has been referred to the Works Committee to carry out, the work shall not be commenced until the officer under whose supervision the work is to be executed shall have given a written order for the work to proceed. There shall be no variation of the plans and specifications without a written order from such officer.

The officer, under whose supervision a work has been carried out by the Works department,' shall certify as to the satisfactory completion of the work and the amount of his final estimate, or the value on the schedule of prices, as the case may be.

*Jobbing Works.*

All works referred to the Works Committee to carry out, which cannot be treated as estimated works, and for which no estimate has been prepared, shall be considered as jobbing works.

No committee, however, shall order a work to be carried out as a jobbing work unless it is satisfied that there is sufficient reason for not treating the work in question as an estimated work, and, except as regards dangerous structure work and works undertaken on emergency, in every instance the committee shall have laid before it by the engineer, architect, or other certifying officer, as the case may be, a rough estimate of the cost.

A schedule of prices agreed upon between the manager of works and the architect and engineer, and approved by the General Purposes Committee, upon which in respect of jobbing works the estimates, measurements, and certificates of the architect, engineer, or other certifying officer shall be based, shall be revised periodically.

*Financial.*

The accounts of the cost of all works executed by the Works Department shall be kept by a Works accountant, whose office shall be at the Works Department, Belvedere-road, but who shall report direct and be responsible to the Works Committee for the accounts and for his staff.

*Manager of Works.*

The head of the Works department is to be styled 'manager of works,' and is to be responsible under the Works Committee for the execution of all works carried out by that committee on behalf of the Council; for advising as to the purchase of plant and material; the regulation and direction of all workshops belonging to the Council; and the supervision of all officials employed upon the execution of works carried out by the department; he shall employ and have the sole control of all officials on weekly wages employed upon such works, and of all foremen, timekeepers, workmen, and persons of a like class; he is to give his whole time to the duties of his office, and not to take any private business; and any fees received by him, either as a witness or in any other capacity, and any discount or allowances on materials purchased, are to be paid to the Council; he is to hold his office during the pleasure of the Council, and the appointment is to be in other respects subject to the conditions already laid down by the Council with regard to all appointments made in its service.

The manager shall report to the Works Committee with regard to the purchase of materials, stores, plant, timber, machinery, horses, and other things required by him for the execution of any work, or for stock.

It shall be the duty of the manager to draw the attention of the Works Committee to any case in which, during the execution of any work, it appears that the cost of the work will exceed the amount of the 'accepted estimate,' and to obtain such authority from that Committee as may be required.

It shall be the duty of the comptroller to advise the Works Committee as to the regulations for the accounts of the Works Department, and from time to time to make test audits of such accounts.

The Works accountant shall be required to furnish the manager with any statement or information he may desire as to the accounts generally of the works carried out by the Department.

(*c*) That standing orders Nos. 182 to 199 inclusive, and 424 and 425 be rescinded, and that the order of reference to the Finance Committee be amended by the omission of the last paragraph, viz., that conferring upon the Committee control of the Works department.

(*d*) That standing order No. 202 be amended by the substitution for the last paragraph thereof of the following, viz.:—

Where points of difference arise between the certifying officer and the manager of works, upon which they are not able to come to an agreement, such officers shall report to the Works Committee, who shall consider the points in dispute, and in the event of the certifying officer or manager of works desiring that any of such points shall be submitted to arbitration, the Works Committee shall arrange therefor.

(*e*) That the following provision of Standing Order No. 275 relating to excess votes—viz., 'the vote for the excess expenditure above any excess for which the Committee ordering the work are responsible shall be obtained by the *Executive Committee at the time of the Finance Committee's* half-yearly report to the Council,' be amended by the substitution for the words in italics of the following:—'Works Committee at the time of their.'

(*f*) That Standing Order No. 436, which provides that officials, clerks, and foremen receiving weekly or monthly wages who are absent in consequence of sickness or accident are to be allowed full pay or reduced pay during a reasonable period at the discretion of the Finance Committee, be amended by the substitution of the words 'Works Committee' for 'Finance Committee.'"

Dr. Napier thought it was essential that there should be a Works Department as a protection against contractors. With regard to the adverse balance on the working of the Department, he believed the Council had far more than saved this by the protection the Department afforded against the contractors. He believed the Works Department had a better chance of succeeding than ever before.

Mr. Beachcroft said they were departing from what he considered the first principles which governed the administration of local bodies in imposing the work on this Committee in the manner indicated in the reference, and he thought they were taking a very dangerous step. There should be no doubt as to who was responsible for the purchase of plant and

material, and he moved to add words to the recommendation, to the effect that the Committee should be responsible to the Council for the purchase of all plant and material.

Mr. Campbell seconded the amendment, which the Chairman ruled out of order.

Mr. Sears regretted that there was to be a revival of the old order of reference. The only new proposal took this form—that in the event of its appearing to the Works Committee that the cost of any job would exceed the amount authorised, the Council should be informed of the fact. He failed to find that the department was, by the new scheme, being placed on a sound business basis, which meant that there must be a complete reorganisation. He advocated the appointment of a general manager who should have the control of the department, with departmental managers under him, in both building and engineering sections.

Sir Arthur Arnold remarked that the Committee's recommendations were in accordance with the suggestions he brought before the Council eight years ago.

The Clerk then read an urgency report of the Committee recommending that the following form the Works Committee:—Lord Welby, Messrs. W. Bruce, E. A. Cornwall, L. Sharp, E. Smith, A. M. Torrance, and D. Waterlow.

Mr. Dew protested against the charges of malingering made against the workmen in the employ of the Council, and alleged that the Department was loaded with officialism.

Mr. W. Peel, M.P., said he noticed it was proposed to keep separate accounts in such a manner as to show the cost of each job. If that had been done in the past they could have told how many bricks per day had been laid.

Mr. Howell J. Williams said the proposed committee should first be elected, and the order of reference then prepared by them. Anything else was absurd, and he moved accordingly.

The motion was, however, rejected.

After some further discussion, the recommendations were adopted, and the Council proceeded to deal with the urgency Report proposing the names of the new Committee.

Mr. Bruce withdrew his name, and that of Mr. Ward was substituted.

Mr. W. Peel, M.P., thought the new Committee would, to a certain extent, be an investigation committee, and he said he felt that no member of the old Works Sub-Committee should sit upon it.

Dr. Napier moved that the selection of names be postponed for a week, but on a division this was rejected by a large majority, and the Committee was elected as recommended, with the substitution of Mr. Ward for Mr. Bruce.

*Historical Records and Buildings Committee.*—The following order of reference to the Historical Records and Buildings Committee was agreed to:—

"The Committee shall consist of not less than twelve and not more than fifteen members.

The Committee shall have charge of the library, historical records, antiquities, and works of art belonging to the Council, and shall have the control, maintenance, and management of museums and places of historic or architectural interest (together with any property connected therewith) purchased by or presented to the Council.

The Committee shall consider and report upon questions relating to historic buildings and sites, monuments and subjects of antiquarian interest in London.

The Committee shall consider and report upon all matters arising under—

(*a*) The Ancient Monuments Protection Act, 1900.

(*b*) Section 60 of the London County Council (General Powers) Act, 1898, relating to the acquisition and maintenance of buildings of historic interest and works of art in London."

*Old-street Improvement.*—A scheme for widening Old-street between Hoxton-street and No. 341, Old-street to about 60 ft., at a cost of 14,250*l.*, was adopted upon the recommendation of the Improvements Committee.

*Erection of Working-class Dwellings in Grove End-road, St. John's Wood.*—The Housing of the Working Classes Committee reported as follows:—

"On March 4, 1902, the Council referred to the Building Act Committee and to us a petition from residents in and around Grove End-road, St. John's Wood, praying that the erection of dwellings for the working classes in Warwick-place, Grove End-road, may not be allowed. The Building Act Committee will, of course, deal with the proposal whenever it comes before them from the point of view of the London Building Acts. We are informed, however, that the dwellings are to be erected by Lord Howard de Walden, and are designed to provide re-housing accommodation for persons to be displaced by the building of high-class flats near Regent's Park on the Howard de Walden estate. Further, we understand that it is proposed that the dwellings shall provide for the re-housing for all such persons. While expressing no opinion as to the particular site selected, we think that if this intention is carried out the erection of these dwellings may well meet with the approval of the Council."

*Wooden Structures Erected on Public Occasions.*—The Building Act Committee reported the decision of the Divisional Court, that the Council of the City of Westminster (and inferentially every Borough Council) is the proper authority to control, approve, or license wooden structures erected on public occasions within its district, and that the Borough Councils are the proper authorities to take proceedings against persons who have, without licence, permission, or approval erected such structures. As to whether such structures are or are not subject to the supervision or inspection of the District Surveyors under the London Building Act the Court gave no decision. In connexion with this decision the Committee reported as follows:—

"We have also had under consideration the question as to how far the decision of the High Court applies to the strengthening of balconies for use on public occasions. This work is dealt with under Part IX. of the London Building Act, 1894, *i.e.*, the part dealing with dangerous structures, and the Council has not treated the shoring erected to make such balconies fit to bear extra weight as structures put up on a public occasion. Accordingly whenever a public function has been announced involving a procession through the streets likely to attract large numbers of persons, a circular letter has been sent out drawing attention to the desirableness of all balconies on the line of route being shored up. An inspection has been subsequently made along the route, and where it has been found that an owner has not taken steps to secure a balcony, such balcony, if found to be insecure, has been dealt with as a dangerous structure. We have come to the decision that the course hitherto followed in dealing with balconies should be continued, and in order to avoid any misunderstanding we have given instructions for an intimation of the Council's intention to be sent to the Borough Councils."

*Proposed Railway Station, Essex-road.*—The same Committee recommended as follows, the recommendation being agreed to:—

"That the Council, in the exercise of its powers under Sections 45 and 53 of the Great Northern and City Railway Act, 1892, do not consent to the erection of a station building on the north-west side of Essex-road, Islington, to abut also upon Canonbury-road, in accordance with the plans submitted with the application of Sir Douglas Fox and partners on behalf of the Great Northern and City Railway Co."

*Office Accommodation.*—The Council agreed to spend 2,400*l.* on structural alterations of offices in Cockspur-street with the view to providing adequate accommodation for the architect's, comptroller's, statistical, and engineer's departments.

*Inspection of Kitchens.*—The Public Health Committee recommended the Council to communicate with the local authorities in favour of the inspection of the kitchens of hotels and restaurants, and the removal of insanitary conditions.

This was adopted without discussion.

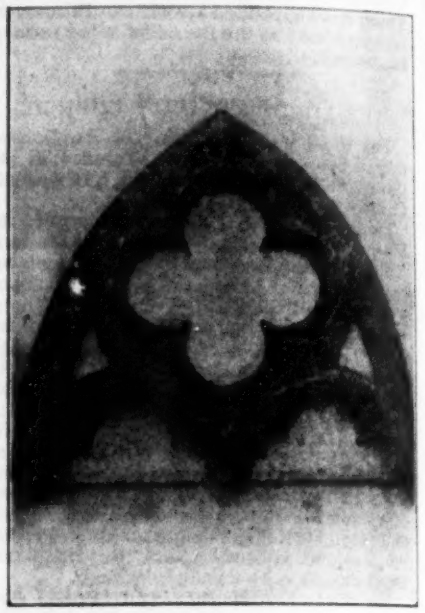
*Proposed New Bridge.*—Mr. Davies moved:—"That, taking into consideration the long distance between Battersea and Wandsworth Bridges, it be referred to the Bridges Committee to consider and report as to the advisability of providing direct means of communication between Fulham and Battersea."

The motion was adopted.

The Council adjourned at seven o'clock.

THE INSTITUTE OF BUILDERS.—The following new officers and members of the Executive Council were elected at the annual meeting of the Institute of Builders:—President, Mr. W. F. King (Messrs. W. King & Son); Vice-President, Mr. Woodman Hill (Messrs. W. Hill & Co.); Hon. Treasurer, Col. Stanley G. Bird; Hon. Auditor, Mr. A. E. Parker (Messrs. Patman & Fotheringham); elected members of the Council, Mr. A. F. Randall (Messrs. Kirk & Randall); Mr. J. Bell, J.P., Cambridge; Mr. W. Nicholson, Leeds; Mr. B. E. Nightingale, London; Mr. W. Sapcote, Birmingham.

SALES BY AUCTION.—On Thursday last week, at the Auction Mart, Messrs. C. C. & T. Moore disposed of freehold and leasehold properties to the extent of 13,660*l.*—a freehold building site, Bear-gardens, Southwark, 6,100*l.*; factory and land, Broomfield-street, Poplar, 1,875*l.*; site and buildings, Furze-street, Bromley-by-Bow, 2,200*l.*; leasehold stabling in Speke-road, Battersea, 400*l.*; freehold stabling in Devonshire-place, London Fields, 710*l.* Also 48 and 58, Mornington-road, Wanstead, 625*l.*; and four freeholds, Candy-street, Old Ford, 1,200*l.*



A PIECE OF TRACERY IN BRICKWORK.

THE above piece of tracery in brickwork is designed and executed by a working bricklayer, Mr. T. Smith, of 19, Deloraine-street, St. John's, S.E. It seems a very creditable piece of brickwork, which we are pleased to illustrate.

## *COMPETITIONS.*

NEW BAPTIST CHURCH AND SCHOOLS, ILKLEY.—After consideration of the forty-two sets of designs submitted, and on the recommendation of their professional advisers, the Committee for this building accepted, as stated in our last issue, the designs marked "A," by Messrs. Garside & Pennington, architects, of Pontefract and Castleford. The designs provide for a church to seat 500, erected in free Gothic treatment in stone, with tower and spire, and covered with red tiles; also a large schoolroom to seat 300, suites of classrooms, &c., and conveniences, and caretaker's cottage. The total cost is 8,000*l.* Messrs. Garside & Pennington have received instructions to proceed with the work.

## *ENGINEERING SOCIETIES.*

THE INSTITUTION OF JUNIOR ENGINEERS.—At the meeting of this Institution held on March 14 at the Westminster Palace Hotel, Mr. Kenneth Gray, Vice-Chairman, presiding, the paper read was on "The Uses of Engineering Models," by Mr. Percival Marshall, A.I.Mech.E., Chairman. The author commenced by pointing out that the high-class condensing steam-engine of to-day can trace its origin back to a working model of one of Newcomen's engines constructed in the eighteenth century, for James Watt made his famous invention of a separate condenser and air-pump as the result of some experiments with a working model engine of this type, which had been placed in his hands for repair. Many interesting models which are to be seen in the South Kensington Museum show that in the early days of engineering invention the construction of working models proved of considerable assistance to those engaged in the development of new ideas. After pointing out the historical value of models as a record of engineering progress, the author suggested that present-day firms would confer a valuable benefit on engineering posterity if they would make a point of presenting to the national collection at South Kensington a scale working model of all important novelties in engineering construction which they might introduce. Dealing with the scientific uses of models, the author proceeded to describe the testing of model ships as carried out at the experimental tanks belonging to the Admiralty, Messrs. William Denny & Bros., and the United States Government, and also quoted the Hon. C. A. Parsons' experiments with modern propellers, which were conducted in connexion with the design of the *Turbinia* and the other high-speed turbine-driven vessels. Further instances of the uses of models for experimental investigation described were Pro-

fessor Dalby's models for investigating the balancing of engines, and Mr. F. W. Webb's model for experimenting with locomotive valve gears. The commercial uses of models were then considered, instances being given of the value of scale models for exhibition purposes to illustrate such classes of engineering work as shipbuilding, dock, pier, and bridge construction, and other work which could not be exhibited in the ordinary way. The commercial advantages of inventors' models, and of small scale models for use by firms handling specialities which were too large to keep permanently on view, or which might require to be sent for inspection to a client at a distance, were next discussed, and reference was also made to the uses of models in law courts and arbitration cases, where such matters as infringement of patents, light and air cases, party-wall disputes, &c., were being tried. The author then passed on to the important uses of engineering models in connexion with educational work, and described the many ways in which sectional and other models are of value to the engineering teacher in facilitating the instruction of his students. Such models when used in the lecture-room not only enable the lecturer to make his subject clear to his audience, but they are far more interesting to the student than ordinary wall diagrams or blackboard sketches, and by attracting his closer attention enable him to more easily remember the information which is being imparted to him. The author advocated the construction of simple, well-designed model engines in technical school workshops in preference to work of a heavier character, expressing his opinion that the average student would learn more about the construction and working of an engine by making a complete model himself than by making one or two parts only of a large engine, and, moreover, would take a far greater interest in doing something which would be entirely his own work when finished. Such a model would call for more delicate and accurate workmanship than a larger engine, which was an advantage in the right direction. A description was then given of a valve-gear model used by the Great Eastern Railway for the instruction of locomotive drivers and firemen, the model being supplemented by a theoretical indicator diagram printed with explanatory notes, a copy of which is given to each man. The author concluded by referring to the value of model-making as a hobby, and quoted several instances of excellent work accomplished by engineering students and amateur mechanics in their spare time. The paper was illustrated by a complete series of lantern slides, and by a large number of exhibits of the various classes of models referred to by the author.

## TRADE CATALOGUES.

THE General Electric Company send an illustrated catalogue of designs for electrical illuminations, in connexion with the approaching Coronation, which they are prepared to carry out.

Messrs. Herbert Morris & Bastert, of Loughborough, send us their catalogue of ordinary and travelling pulley blocks. The latter when made with geared trolleys are extremely useful adjuncts in manufacturing establishments and on outdoor structural work. "Runways" are also made for use with the pulley blocks, serving every part of a works, running from one department to another, with branches to any desired point, forming a perfect network of communication. Thus a lad is enabled to pick up a ton load and deliver it a hundred yards away in a few minutes. The list gives illustrations showing various useful applications of the system

Messrs. Twyfords, Ltd., of Cliffe Vale Potteries, Hanley, send us their "Twentieth Century Catalogue of Sanitary Specialities." It is a well-bound volume of about 200 leaves, clearly printed and admirably illustrated. Many of the illustrations are excellent examples of colour-printing. The work is divided into two parts, the first comprising cast-iron baths and articles made in Royal C.V. porcelain, earthenware, "Vitrina" ware, and cane ware, and the second dealing with enamelled fireclay goods and accessories. The place of honour on the first coloured plate is given to the "Twycliffe" siphonic water-closet; two examples are shown, one with the basin decorated in blue and gold, and with the cistern enclosed in a porcelain casing similarly decorated, and the other with an ivory-white basin with ornament in relief, and with the cistern cased with wood. The next three plates show other varieties of the same apparatus, and on the backs of the plates sections of the basins and fittings are drawn one-eighth full size. The "Axis" siphonic closet follows. Nineteen plates are devoted to various types and combinations of washdown closets, and six to the obsolescent wash-out closets. Only one complete valve-closet is shown, and that forms one of thirteen illustrations of valve-closet basins, slop-hoppers, and slop-tops, crowded together on a single plate, which is followed by a plate of pan-closet and other objectionable basins. Among the other illustrations in this section we notice some examples of closets with the cisterns fixed immediately above the seats, railway-car hoppers, cheap cane-ware closets and traps in separate pieces, flushing cisterns, flush-pipes, pulls, and other accessories. It is a pity that so much labour has been expended in designing and printing the meaningless ornament so profusely bestowed on many of the closet-basins. Architects, at any rate, ought to know better than to select fittings "decorated" in this inartistic fashion. A plain white or ivory surface, on which every speck of dirt can be seen, is in every way most satisfactory, but many plumbers and householders have yet to be educated to see this. Many of the lavatory basins are disfigured in a similar manner by floral decorations sprawling without rhyme or reason over the basins and slabs. Of course this is a trade catalogue, and the trader considers himself bound to produce what his customers desire, but it is possible that the trader might be agreeably surprised if he would venture to set a new fashion instead of weakly following an old one. Among the lavatories are many which can only be regarded as old-fashioned, but in front of these are placed others of better design with improved wastes and overflows of various kinds. The "Sphere," the "Cardinal," and the "Neros" can all be recommended. The woodwork of some of the cabinet lavatories (such as No. 377) is well-designed, but in many of the examples it is commonplace or worse. The new lavatory stands and supports are more satisfactory; No. 392 is a good range of basins with marble slabs and back and brass tubular supports. Space would fail us, however, if we were to attempt to pass in review the sixty-three plates of lavatories; there are varieties to suit different tastes and different purses. The trapped urinal basin to which the place of honour is assigned in the urinal section is of doubtful value; in our opinion the type shown on the next plate is much better. In the fireclay section illustrations are given of strong water-closets and other fittings, including some fine examples of double and treble sinks. The catalogue, as a whole, will be of great service to architects and builders. It contains sanitary fittings of every kind, suitable for houses of different classes, hotels, schools, hospitals, and other buildings. The prices are stated in nearly every case, and the dimensions are given in feet and inches and in centimètres and millimètres.

The Leicester Laundry Engineering Co. (Leicester) send an illustrated catalogue of their laundry machinery, including their patent "open-end" washing machine, in which the machine is fed at one end, instead of at the side; by this arrangement all stooping during the process of loading or unloading is unnecessary, and the clothes are removed from the machine ready drained by having the division perforated. The central shaft passes through the whole length of the machine, and is enclosed with brass tubing; this shaft is of steel, and, passing from end to end of the inner cage, prevents the twisting of the cage on reversing. The lid of the feeding door is arranged similar to a double hinge, one half falling over the gap between the inner and outer cage, thus preventing any clothes dropping inside. The catalogue also shows wood rotary washing machines, and boilers and driving engines, &c.

Messrs. Jones & Campbell (Larbert) send a small catalogue and price-list of portable and other ranges, stoves and grates; among the stoves the "Slogan" slow combustion cylindrical stove, with brick lining, seems a useful one where saving of space and of fuel is important.

We have received from Messrs. G. B. Kent & Sons their 1902 catalogue of painter's brushes, graining tools and soldering, brazing, and paint-removing lamps.

Messrs. Richard Moreland & Son send a compact but very useful and well-arranged catalogue of their steel stanchions and box girders, with full tables of bearing capacity and weight. To the catalogue are also appended a good many sections and descriptions of trussed steel roofs and theatre trusses erected by them in various buildings, and a table of sizes of steel bases and brick piers for loads from 20 to nearly 200 tons. A quotation from a report on one of their structures by Mr. A. T. Walmisley gives very satisfactory testimony.

Messrs. Norton & Gregory send us a small book of samples of their tracing cloths and tracing papers, which seem excellent in substance and surface, and the tracing-cloths are absolutely transparent. They send also a price list of their terms for various methods of reproducing drawings, and for mounting competition drawings, &c.

Messrs. Pilkington Bros. (St. Helens) send a description and illustration of their patent wired rolled glass, which has before been recommended in our columns, and also a description and diagram of their prismatic rolled glass for deflecting the light towards the back of an apartment.

Messrs. Potter & Co. send us an illustrated pamphlet on their various forms of concrete and steel floors, among which we may especially notice Diagram F, for a floor under a ground floor sick ward, which is supported entirely on concrete arches and piers, no steel joists being used except small corrugated steel tension rods embedded in the concrete.

The St. Pancras Ironwork Company's latest catalogue offers everything that can be required for the best fitting of stables in regard to stalls and manger fittings, ventilation, and drainage. The catalogue is fully illustrated, and everything in it shows a thoroughly practical consideration of the subject.

Messrs. Pilkington & Co. send us a pamphlet on their asphalte materials, including Pyrimont Seyssel asphalte, Limmer asphalte, and Polonceau asphalte. The last-named is a material manufactured by them, based on an analysis of Seyssel asphalte, and is stated to be superior to Seyssel at a considerably reduced cost. It is suitable especially for the flooring of warehouses and the paving of coach-houses, stables, &c. The results of some tests of this at Kirkaldy's are given. They give also details and sections of asphalte roofing, consisting of a layer of Polonceau asphalte ½ in. thick, then a layer of specially-prepared hair felt, which in turn is covered with a finishing coat of Seyssel asphalte ½ in. thick. Their white Silica asphalte is recommended for the lining of fountain basins and the paving of corridors, terraces, &c.

Messrs. Ewart & Son send an illustrated catalogue of their numerous forms of revolving cowls, windguards, and elbow-flues, for chimneys.

## BOOKS RECEIVED.

THE PARSON'S HANDBOOK. By the Rev. Percy Dearmer, M.A. Fourth Edition. (Grant Richards.)

A TREATISE ON THE ART OF GLASS PAINTING. By Ernest R. Suffling. (Scott, Greenwood, & Co., 7s. 6d.)

MINEHEAD, PORLOCK, AND DUNSTER (Homeland Handbooks Series). By C. E. Larter. (The Homeland Association. 6d.)

COMPANION TO ENGLISH HISTORY (MIDDLE AGES). By F. Pierrepoint Barnard, M.A., F.S.A. (Clarendon Press.)

HISTORY OF TRADE UNIONISM. By Sidney and Beatrice Webb. New edition. (Longmans.)

GAS AND GAS-FITTINGS, FOR THE USE OF ARCHITECTS, BUILDERS, AND GAS CONSUMERS. By H. F. Hills, F.C.S. (D. Fourdrinier, *Builder* Office.)

SCHOOLS, HIGH FELLING, DURHAM.—A site in Falla Park-road was secured twelve months ago, and a portion of the Heworth' School Board's scheme is nearly completed by the erection of a junior school to accommodate 320 children and an infant department for 200. It is also intended in the course of time to erect a mixed school. The architect for the building is Mr. H. Miller, Felling. The schools have been erected on the central hall principle, with classrooms grouped around, and light has been secured mainly by windows in the gables. The junior and infants' schools are in two separate blocks, each of one story, with the exception of the central hall, which has clearstory windows and roof lights. Sherburn bricks have been used to face the exterior walls, and internally there is a white glazed brick dado. In addition to the various classrooms, apartments for teachers, and cloakrooms, have been provided in each block. There are partly-covered playgrounds. Mr. J. W. Braithwaite, of Heaton, has been the contractor for the work.

# Illustrations.

## DOORWAY, ST. SAUVEUR, AIX (PROVENCE).

THIS drawing, representing one of the doors from the main western portal of the Cathedral of St. Sauveur at Aix-in-Provence, was one of the drawings that gained for Mr. Wontner Smith the Pugin Studentship this year. It has been made from the cast at South Kensington.

Though a very good drawing, it has some of the defects incident to copying from a cast. The doors are of course woodwork (sixteenth century), but there is nothing in the drawing to indicate the difference of material; especially as the jointing of the stonework, which appears in the cast, has been omitted. Apart from this, it is a very careful delineation of a fine and interesting piece of decorative work, in which Gothic and Renaissance elements are curiously mingled.

## CEREMONIAL TROWEL AND CASKET.

THIS is an illustration of the trowel, and the casket to contain it, which was used by the King in laying the foundation stone, the other day, of the Royal Naval College at Dartmouth.

The reverse side of the trowel is engraved with the following inscription :—

"I was used by his Majesty King Edward VII. on 17th day of March 1902 at the laying of the foundation stone of the Britannia Royal Naval College, Dartmouth."

A decorative anchor helps to fill up the lower part of the trowel-blade, its lines fitting in more or less into the shape of the trowel at the point.

The trowel is of silver with gold enrichments, and the casket in cast bronze and silver. The figures at the angles represent winged amorini balancing themselves on the crests of waves.

The work was executed by Messrs. Walter Gilbert, S. Hovel, and L. Weingarten, of the Bromsgrove Guild of the Applied Arts, Worcestershire, working under the suggestion and direction of the architect, Mr. Aston Webb.

Trowels and presentation caskets for such occasions are so often mere pieces of shop furniture, that we have pleasure in illustrating one which shows artistic and original character.

The illustrations are from photographs by Mr. T. Lewis, of Birmingham and Bromsgrove.

## WALL DECORATION FOR A BATH-ROOM.

THIS design was made by Mr. C. H. Temple for Messrs. Maw & Co., to be executed in the materials manufactured by that well-known firm.

The wall decoration is in tiles, faience, and mosaic; the cornice, architrave, pilasters, and skirting are in modelled faience; the frieze and figure panels are painted tiles; the borders and dado panels mosaic. The whole of the colouring is in shades of mignonette green, with the exception of the mosaic portion, which is in lustres of pale yellow sienna on burnt sienna ground.

## RESIDENCES, WEETWOOD, NEAR LEEDS.

THE semi-detached residences illustrated are situated in a wooded district about three miles north of Leeds. Prior to the erection of the houses an old farmhouse, which had been considerably added to from time to time, occupied the site. The building, with the exception of a recent addition at the eastern end, was pulled down, and two new houses erected on the ground upon which the old residence formerly stood, it being a stipulation of the owner that the old frontage lines should be adhered to as far as possible. This accounts to a large extent for the disposition of plan,* and the different levels of the new houses.

The lower stories are faced with herring-bone broached local sandstone, lined internally with brick. In the upper stories the walls are built hollow, the utilised internal linings of brick, and the outer walling built of coursed rubble wallstones from the old demolished building, and coated with cement "rough cast" or "pebble dash," finished a deep vellum colour. The exterior woodwork of the gables, window-frames, and cornices is painted willow green. The roofs are covered throughout with stone, or what are locally known as "grey" slates.

The houses were built by Messrs. Matthew Wilson & Son, of Headingley, near Leeds, and they have been carried out from the designs and under the superintendence of Mr. William H. Thorp, of Leeds.

* Unfortunately the plan did not reach us until too late for publication.

## ADDITIONS TO "BISHOPSFORD."

THE drawing shows additions made to a modern house, "Bishopsford," in Surrey.

The materials are yellow stock bricks and green slates, except the large chimney-stack, which is red.

The builders were Messrs. Maides & Harper, of Croydon; and the architect Mr. Halsey Ricardo.

## LIVERPOOL INFIRMARY FOR CHILDREN.

THE Liverpool Infirmary for Children, when founded in 1851, was the only provincial hospital devoted exclusively to children. That there was need for such an institution is shown by the fact that in the first ten months 657 out-patients were treated by the medical staff, and that the numbers, with minor fluctuations, have increased year by year to their present enormous proportions, when somewhere about 14,000 new cases, with from 50,000 to 60,000 attendances, are treated annually.

The building first used was a small private house in Upper Hill-street, but within three years, its accommodation proving inadequate, a move was made to a larger house—46, Great George-street. In 1856 the increasing number of patients rendered another migration a necessity, and a house (No. 58) in Hope-street was rented, and room for the first time provided for in-patients.

The charity continued enlarging its sphere of usefulness till, in 1866, the present site was obtained, and on June 23 the late Duke of Saxe-Coburg, then Duke of Edinburgh, laid the foundation-stone of the building which is now being superseded.

In the last year at Hope-street there were seen 4,093 individual out-patients, numbers which increased in the first year at Myrtle-street to about 5,000, with an average of 16,000 or 17,000 attendances.

The year 1878 saw the need for a further enlargement of the out-patient department of the new hospital, and in 1880 the Committee reported that "the attendances reached the extraordinary total of 29,250!" Since then, notwithstanding various devices for reducing the frequency of attendance and the imposing of a limit (first of sixty, then of fifty) to the number of new cases seen on any one day, there has been a steady increase till the maximum was reached in 1898.

The need for a new building is evident when it is considered that not only are twice as many patients seen as fifteen years ago, when the accommodation was then already reported inadequate, but that also the present department forms the ground floor, above which a large ward and the nurses' home are located. The inevitable result of this conjunction was that overcrowding has ensued, and constant outbreaks of diphtheria and other infectious diseases in the hospital have necessitated frequent closing of the whole infirmary, and nearly continuous disuse of one or more wards.

In 1900 a suitable site opposite the hospital, and entirely separated from it by the width of a side street, was by great good fortune obtained, and a new and completely detached building for the sole purpose of the out-patient clinic is in process of erection preparatory to the total demolition and rebuilding of the whole infirmary. After competition the plans of Messrs. Haigh & Thompson, of Liverpool, were accepted by the Committee, and the work is now in progress under their direction.

The new "extern" stands alone, surrounded by streets on three sides and a public passage on the fourth; it has therefore been possible to obtain light and ventilation on all sides.

The patients' entrance is at the south-west angle of the building, approached from the principal thoroughfare called Mulberry-street, and exactly opposite the infirmary. It opens into a space for the accommodation of perambulators and through this communicates directly with a large waiting-hall. The latter is placed in the centre of the building, and round it are grouped the various consulting, examining, and operating rooms. Near the entrance is a registration-room, adjoining which an isolation-room is provided from which infectious cases can be removed without their re-entering the main building. The dispensary is suitably placed opposite the principal entrance, to the right of which are also conveniences for the women and children. At the north end of the building, next Mulberry-place, is the entrance for the staff, near which the various rooms for doctors and nurses are situated, with lavatories and other conveniences. An ophthalmic room is provided, also a store for splints, &c. At this end of the building are placed the heating cellar in the basement, and on the first floor accommodation for the keeper and his wife, with a small yard.

The building generally is one story high; the waiting-hall, being higher than the adjoining rooms (and above the keeper's yard, which is on the first floor), can therefore be lighted and ventilated on four sides, which is an obvious advantage in getting a blow through. The rooms are to be warmed by hot water, the fresh air passing through the radiators. Provision is also made for admitting fresh air by means of Leather's ventilators.

All windows have opening casements. The various rooms have extract ventilators connected with the trunk in the roof, which is turned into an automatic ventilator fixed in the centre of the ridge to the main roof.

The interior walls are lined with glazed bricks dado high, having round internal and external angles both horizontally and vertically. All the joints at completion will be raked out and finished flush with Parian cement. The wall surfaces above the glazed bricks will be rendered in Portland cement finished with a smooth surface of Parian, which will ultimately be painted in white ripolin. The floors generally are to be paved with terrazzo. The front entrance will have an inclined plane without steps.

All lavatories, sinks, water-closets, &c., will be bracketed from walls, without floor supports. Electric light is to be used throughout.

The building is being built of Accrington red bricks with Darley Dale stone dressings, the roofs being slated.

The architects, Messrs. Haigh & Thompson, of Liverpool, have been able to give the history of this charity through the courtesy of Dr. Hubert Armstrong, the hon. secretary to the Medical Board, and it is from the assistance rendered to them by that Board that they are hoping to produce a building that will be as complete and perfect as any hitherto erected, if it does not excel them.

## APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

*Lines of Frontage and Projections.*

*Lewisham.*—Retention of houses on the north and south sides of Engleheart-road, Catford (Messrs. H. and G. Taylor).—Consent.

*Dulwich.*—A one-story workshop at the flank of No. 10, Crawthew-grove, East Dulwich (Mr. A. E. Mullins for Mr. Baker).—Consent.

*Marylebone, West.*—A stone portico at the entrance to No. 48, Bryanston-square, St. Marylebone, to abut upon Upper George-street (Mr. C. Young for Viscount Chelsea).—Consent.

*St. Pancras, East.*—The retention of wood and glass roofs over the area in front of No. 24, Great College-street, Camden Town (Messrs. Charles Goodall & Son, Ltd.).—Consent.

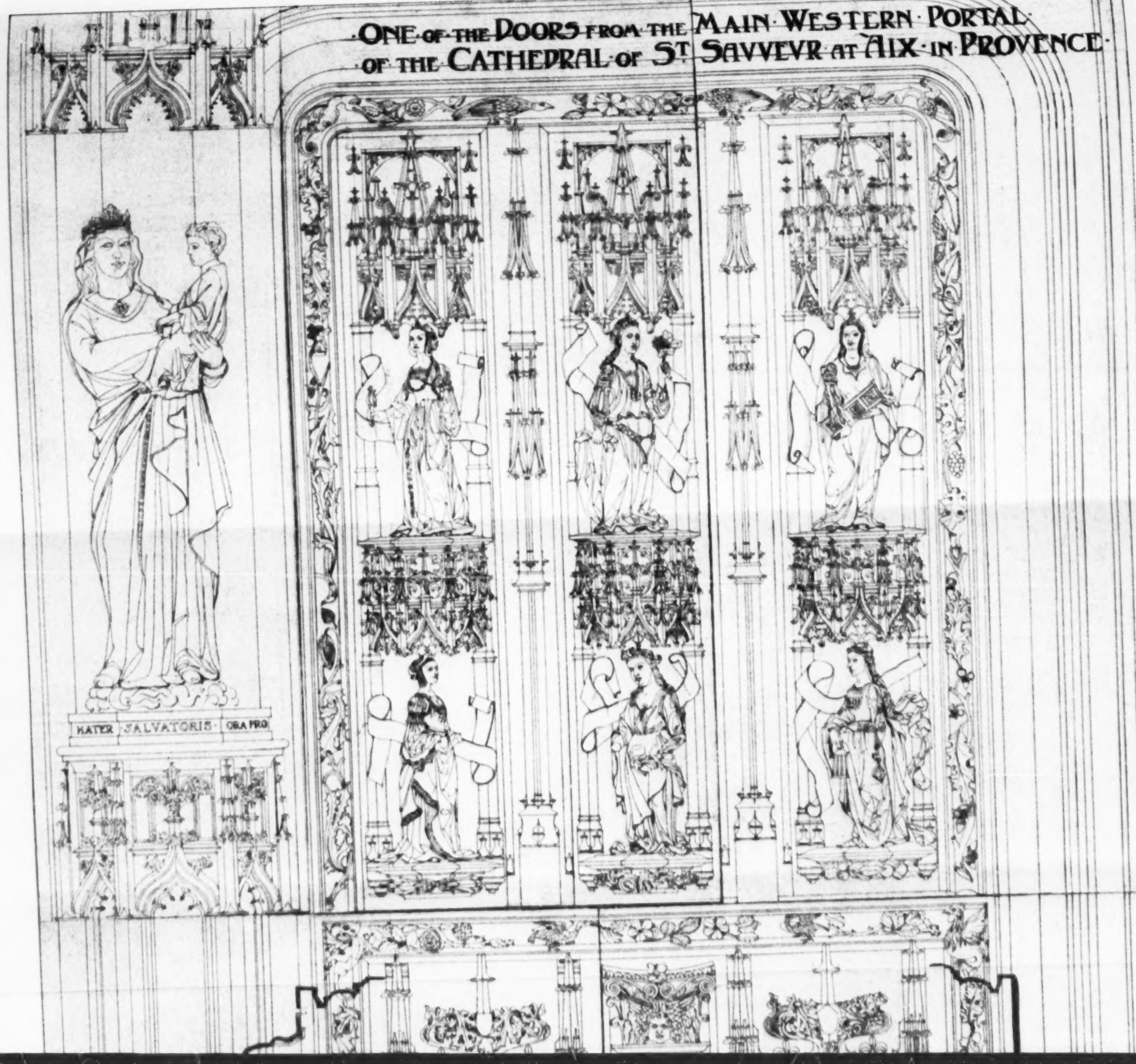
*Chelsea.*—Two oriel windows at the first, second, and third floor levels, and one oriel window at the first, second, third, fourth, and fifth floor levels, in front of the Swan tavern, Nos. 3, 4, and 5, Sloane-street, Chelsea (Mr. L. A. Withall for Messrs. Roberts & Gilling).—Refused.

*City.*—An oriel window at the first, second, third, fourth, and fifth floor levels at No. 6, Cheapside, City (Messrs. F. Chambers & Son for Messrs. A. C. White & Co.).—Refused.

*Hackney, South.*—Three-story buildings on the forecourts of Nos. 206 to 216 (even numbers only, inclusive), Morning-lane, Homerton (Mr. W. Hall).—Refused.

*Holborn.*—A projecting metal sign at the second-floor level in front of Nos. 252, 254, and 256, Tot-

# ONE OF THE DOORS FROM THE MAIN WESTERN PORTAL OF THE CATHEDRAL OF ST SAVVEVR AT AIX IN PROVENCE



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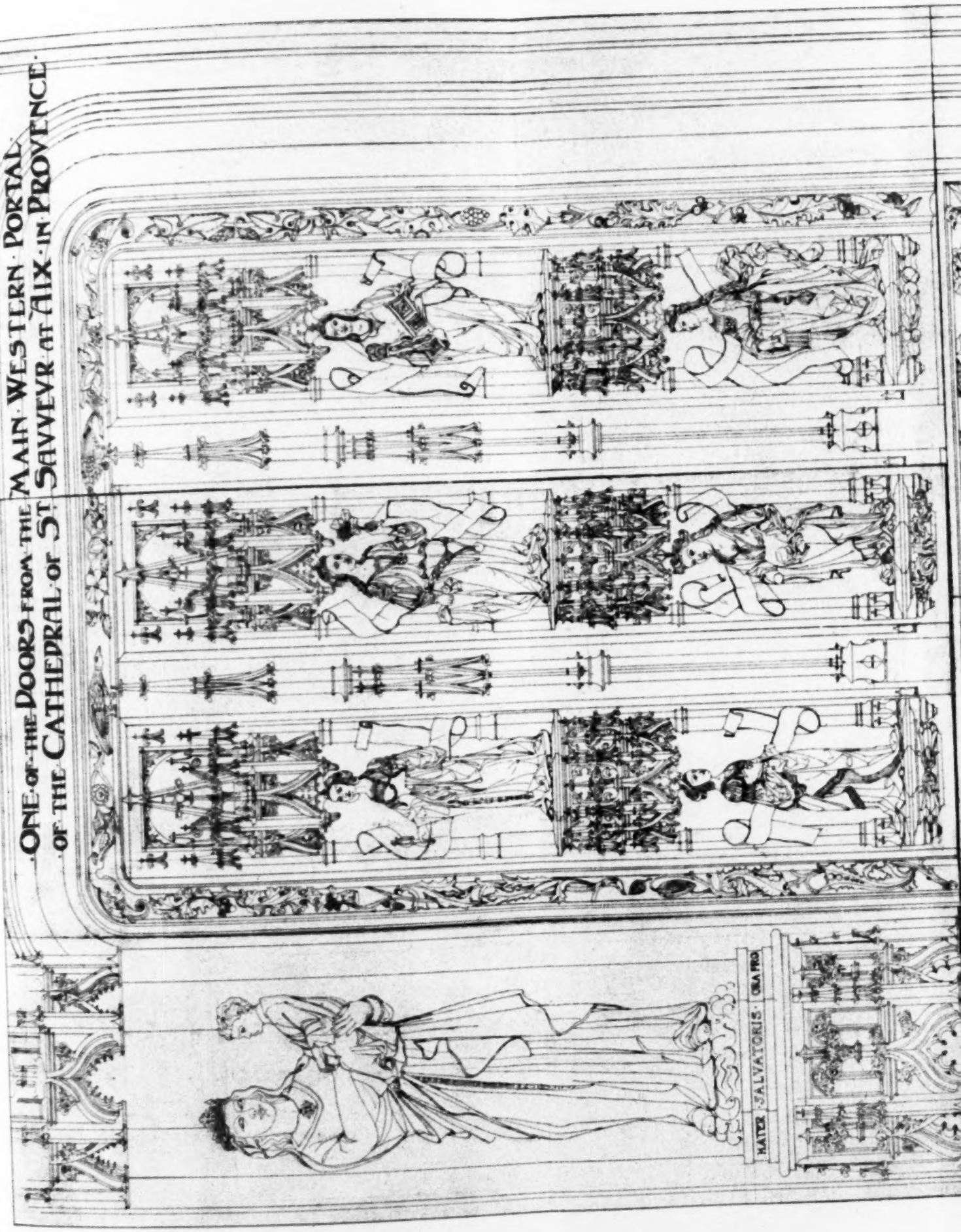
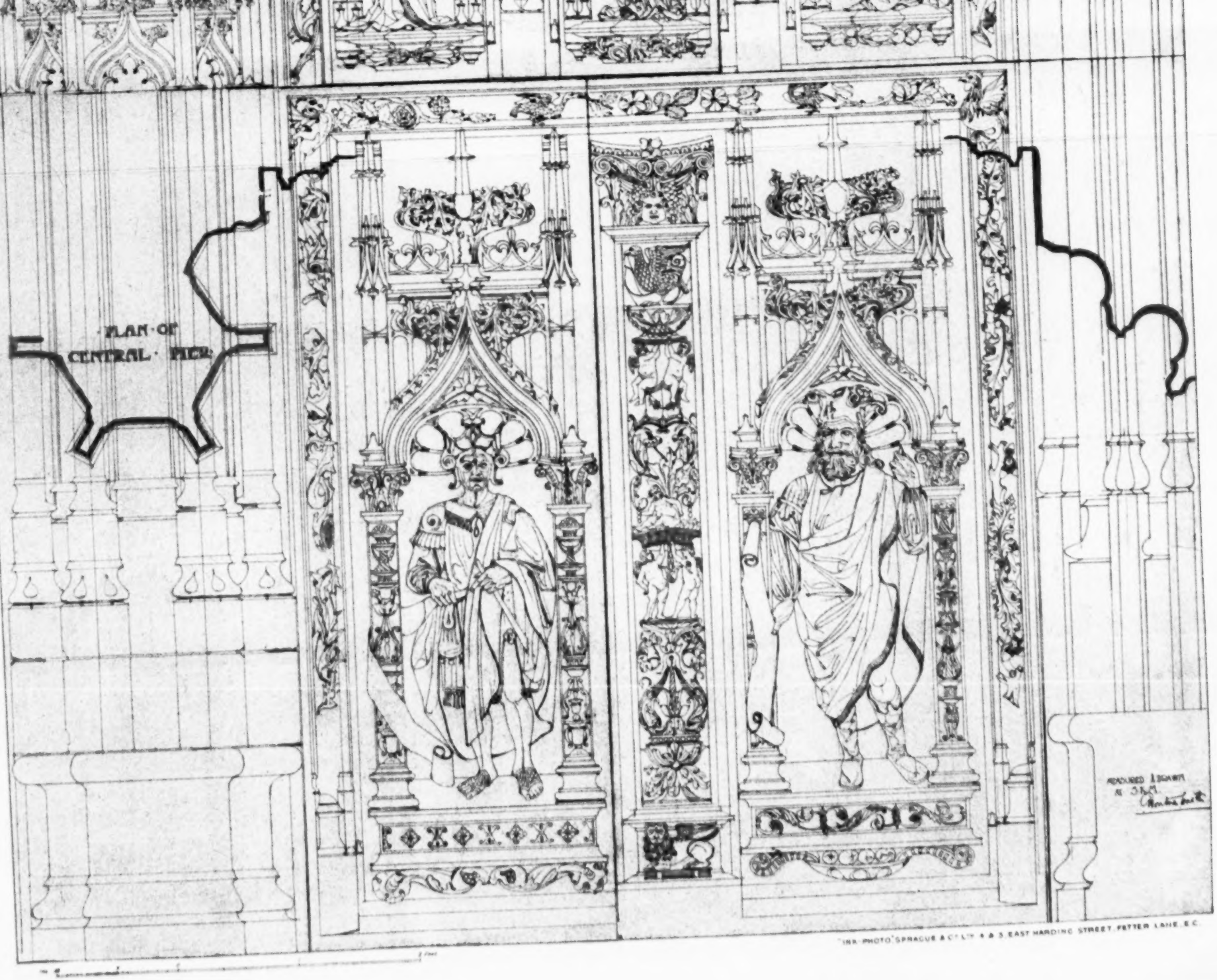
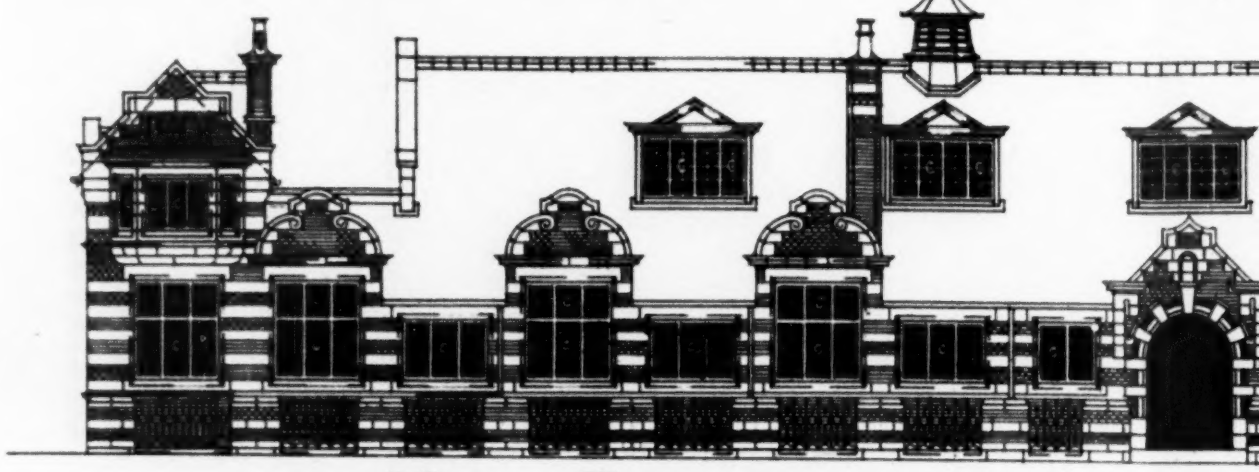


PLAN OF CENTRAL PIER



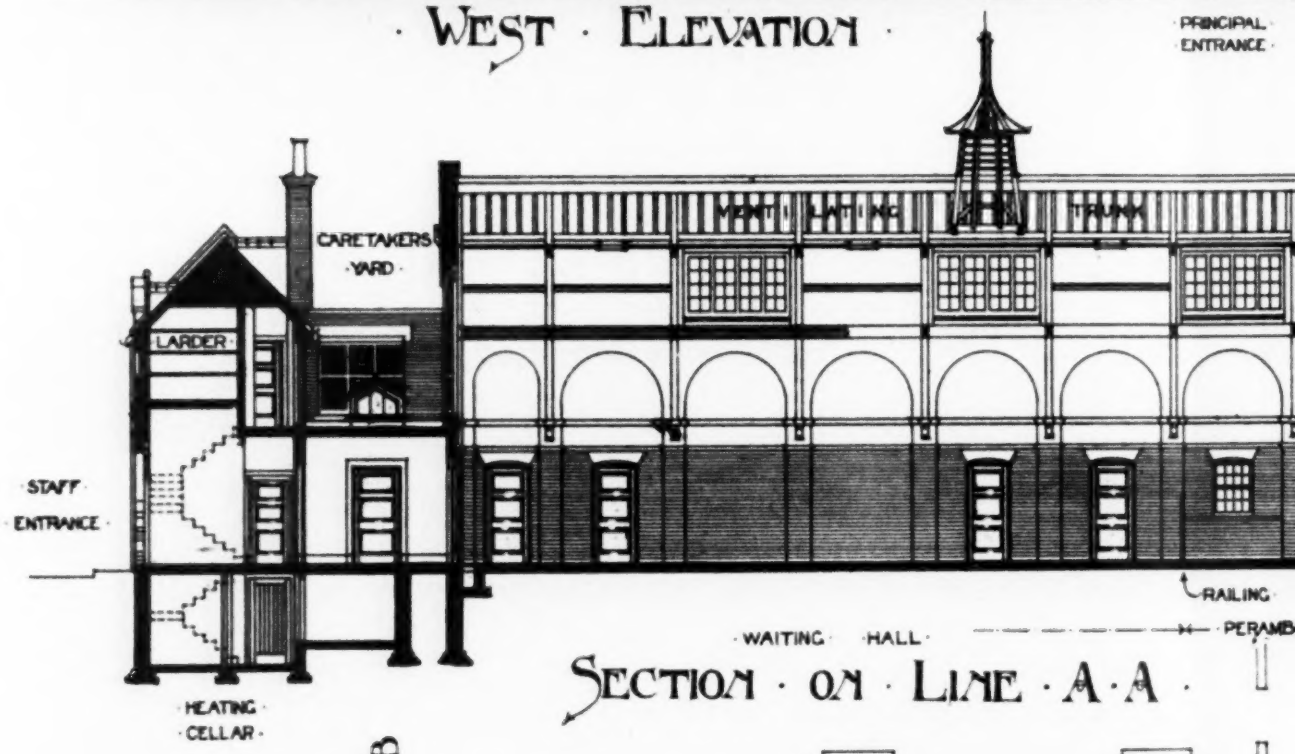
Pugin Studentship, R.I.B.A., 1902.

SCALE OF FEET

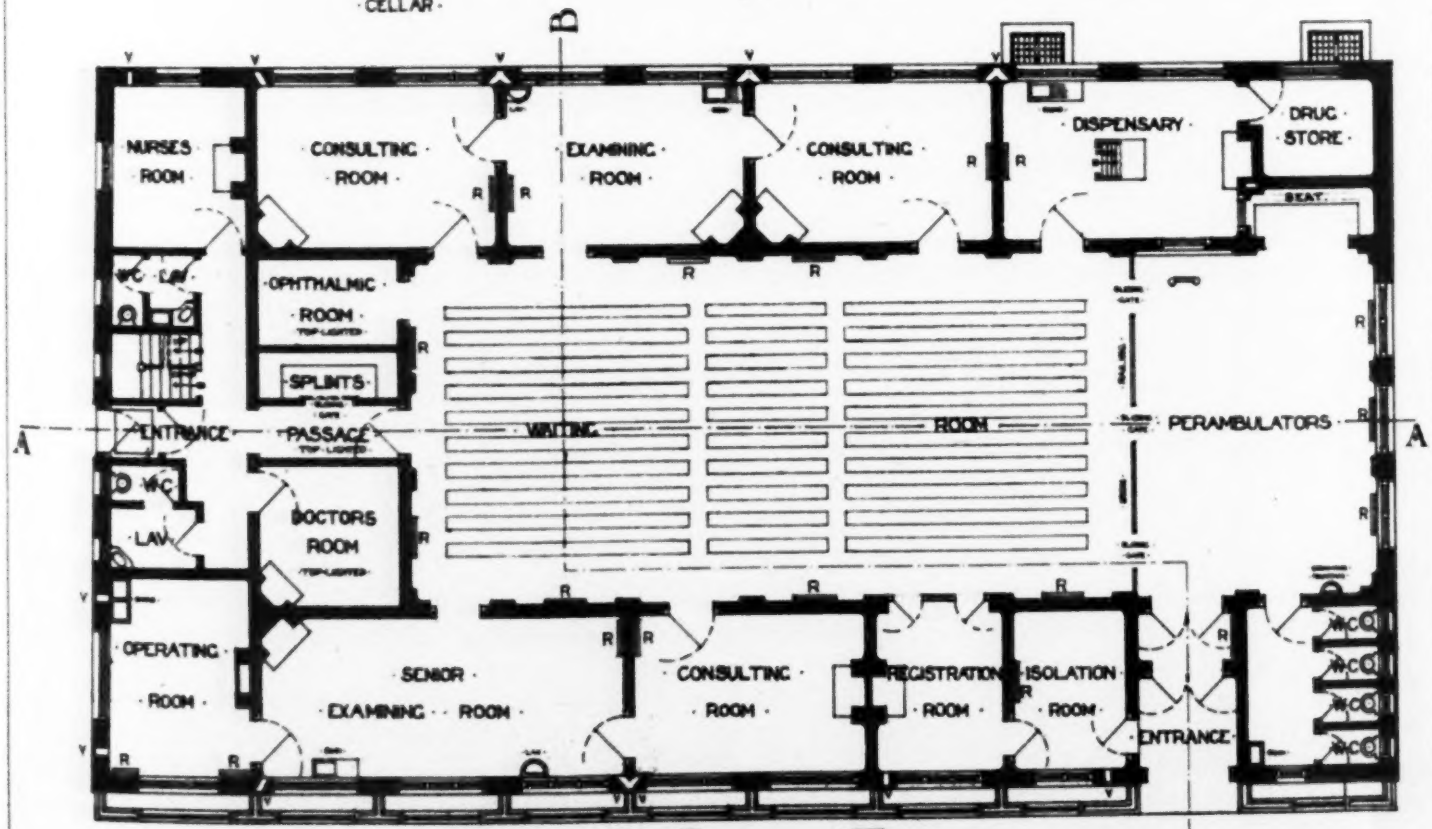


WEST ELEVATION

PRINCIPAL ENTRANCE

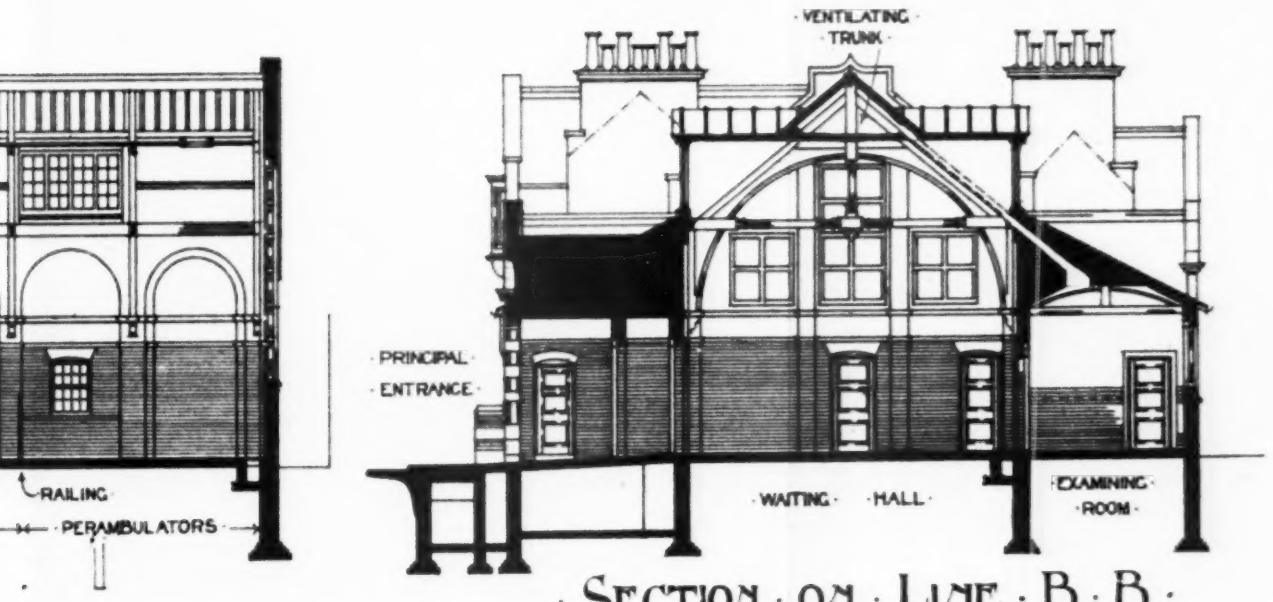



SECTION ON LINE A-A

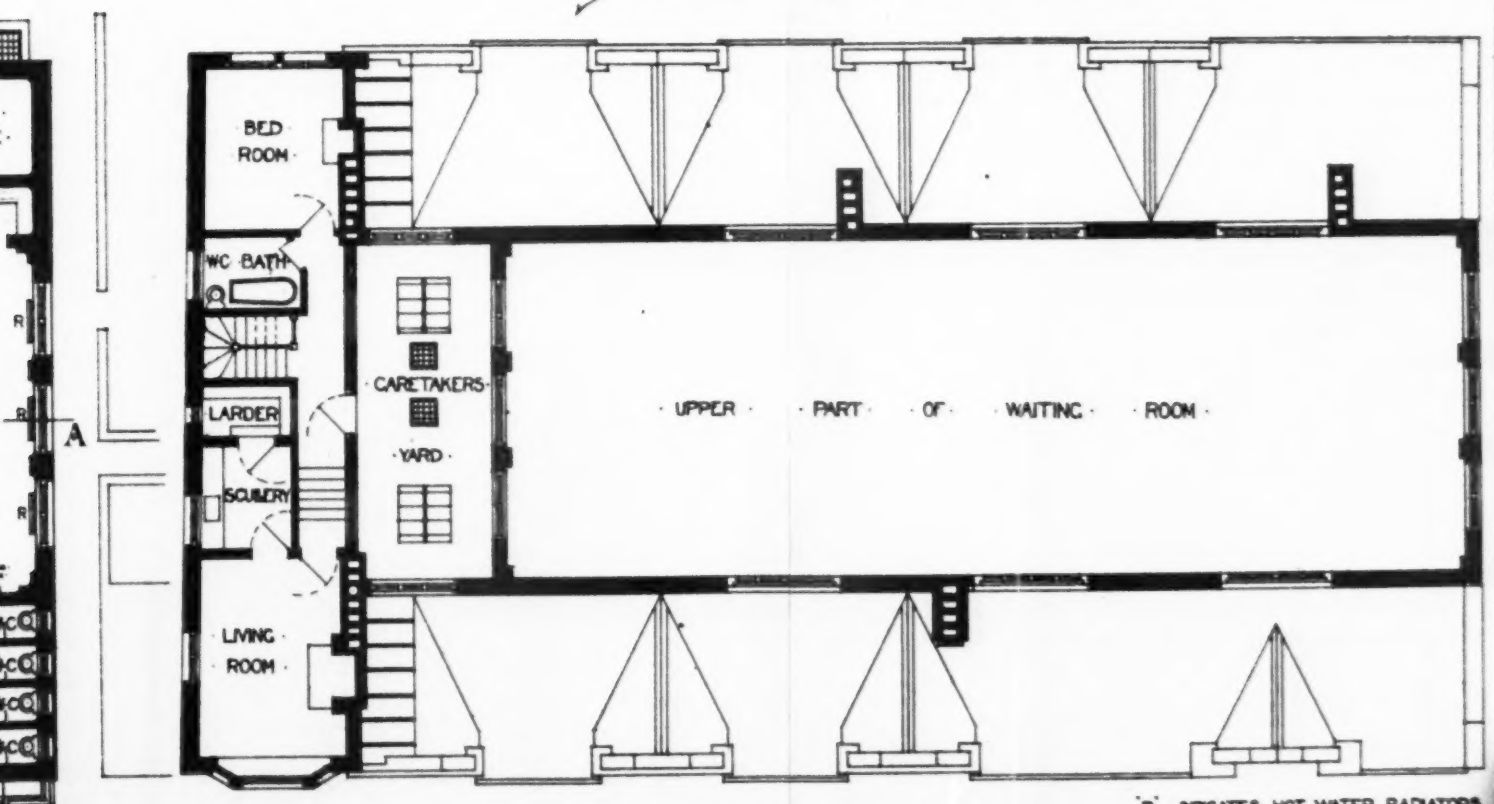



PLAN OF GROUND FLOOR

SOUTH · ELEVATION ·




SECTION · ON · LINE · B · B ·




PLAN · OF · UPPER · STAGE ·

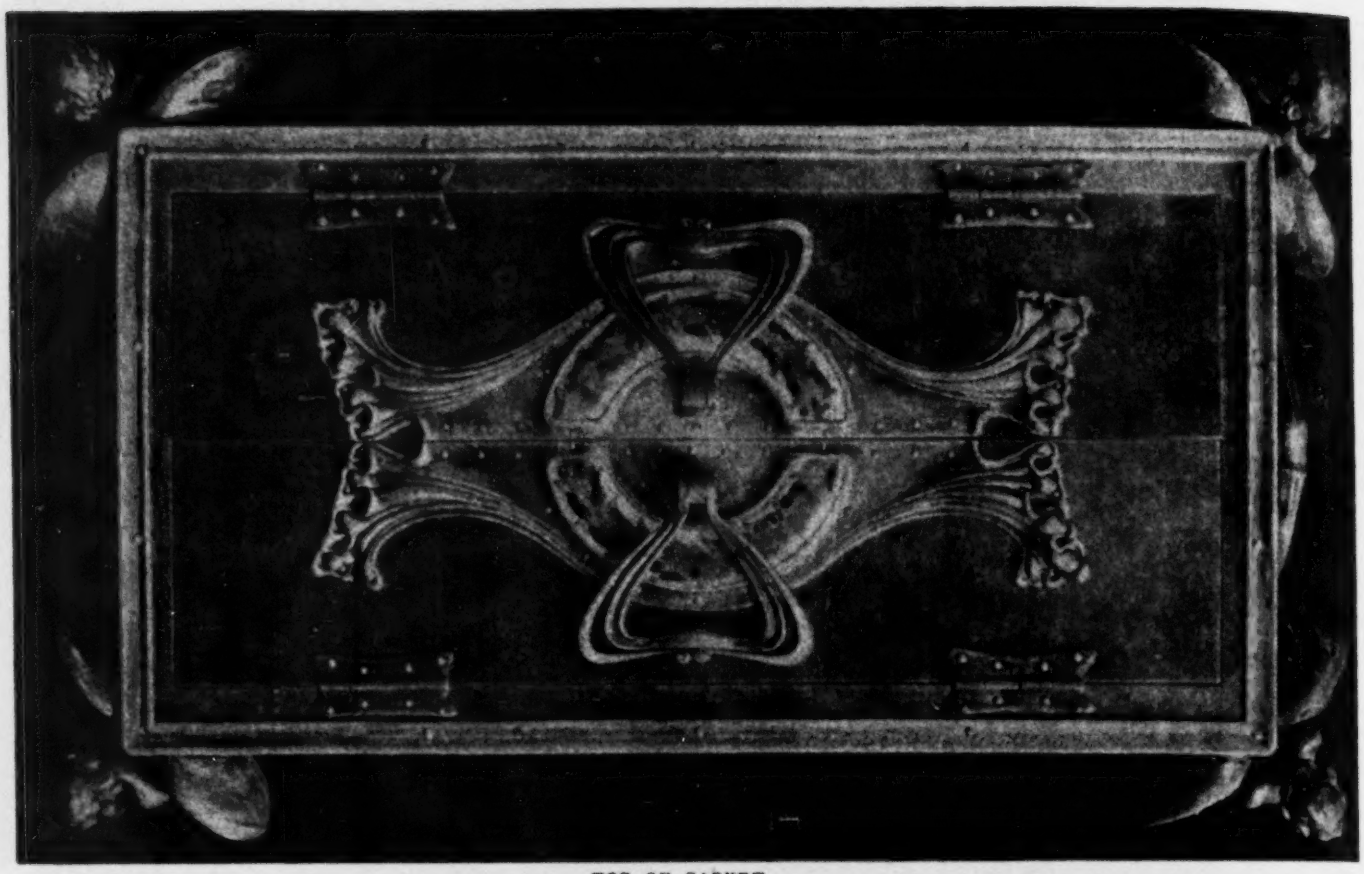
'R' INDICATES HOT WATER RADIATORS
'V' INDICATES FRESH AIR INLETS

PHOTO LITHO. SPRAGUE & Co. LTD. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

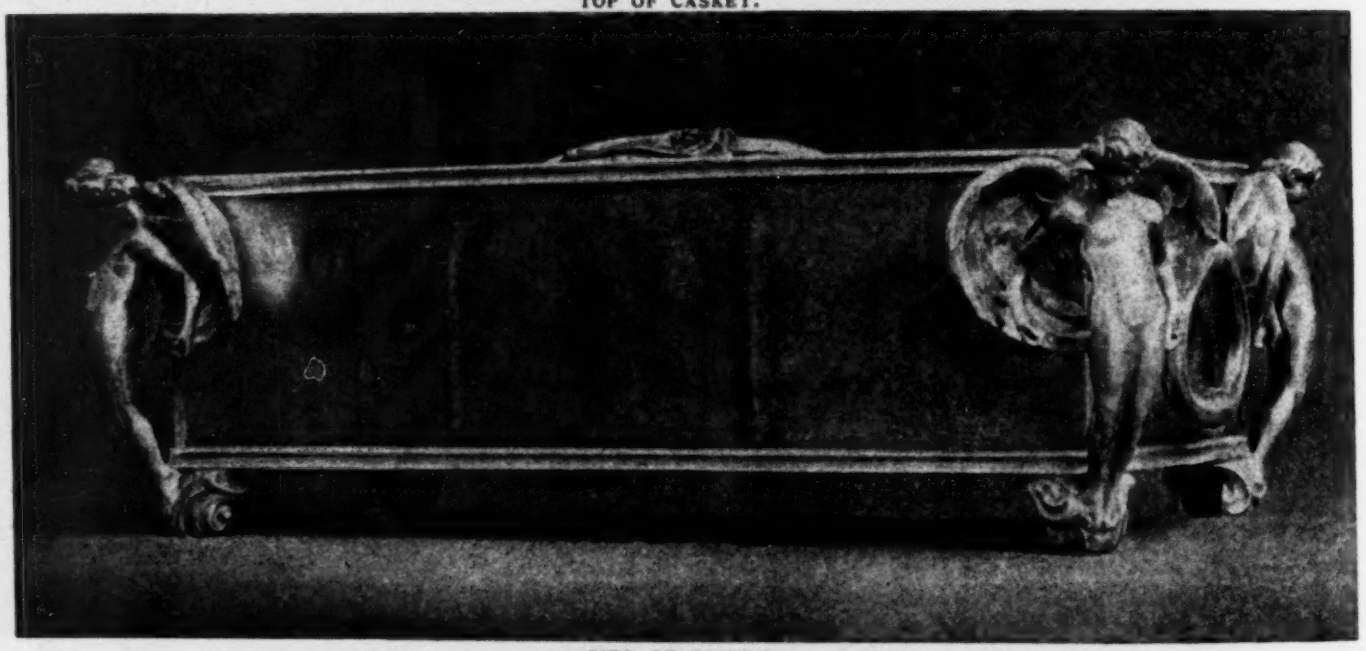
IRMARY, LIVERPOOL.—MESSRS. HAIGH & THOMPSON, ARCHITECTS.

RESIDENCES, WEETWOOD, NEAR LEEDS.

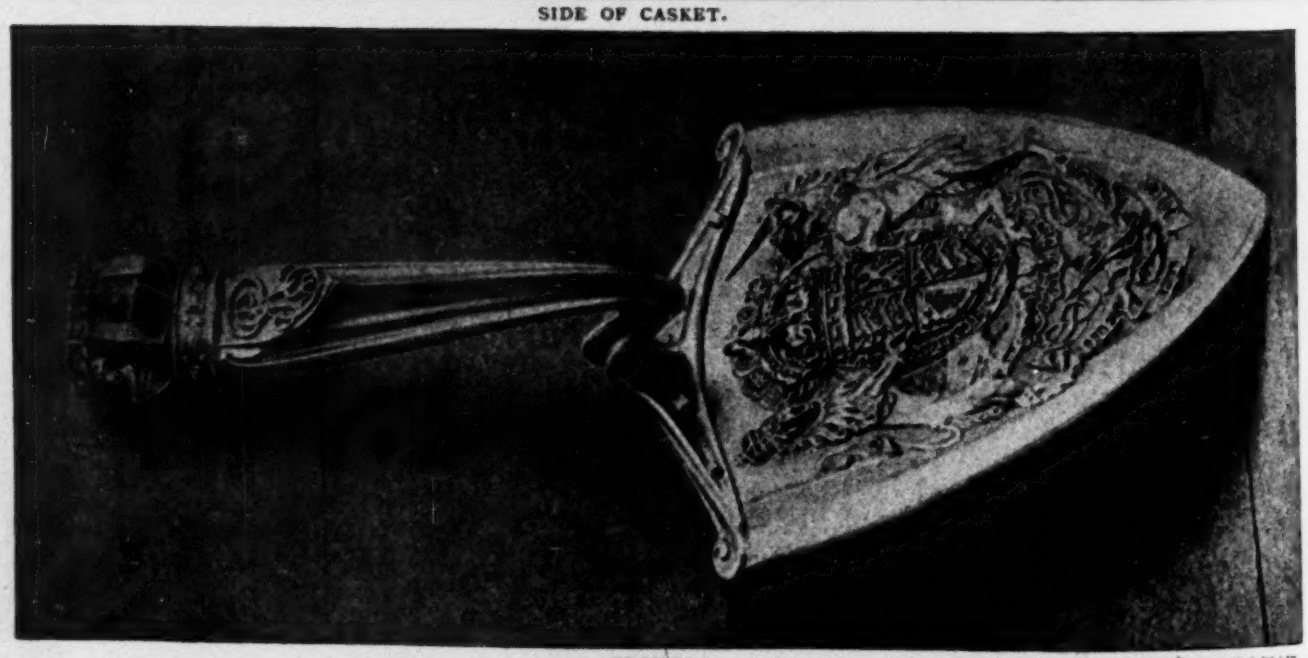
WILLIAM H. THORP, ARCHITECT.



TOP OF CASKET.



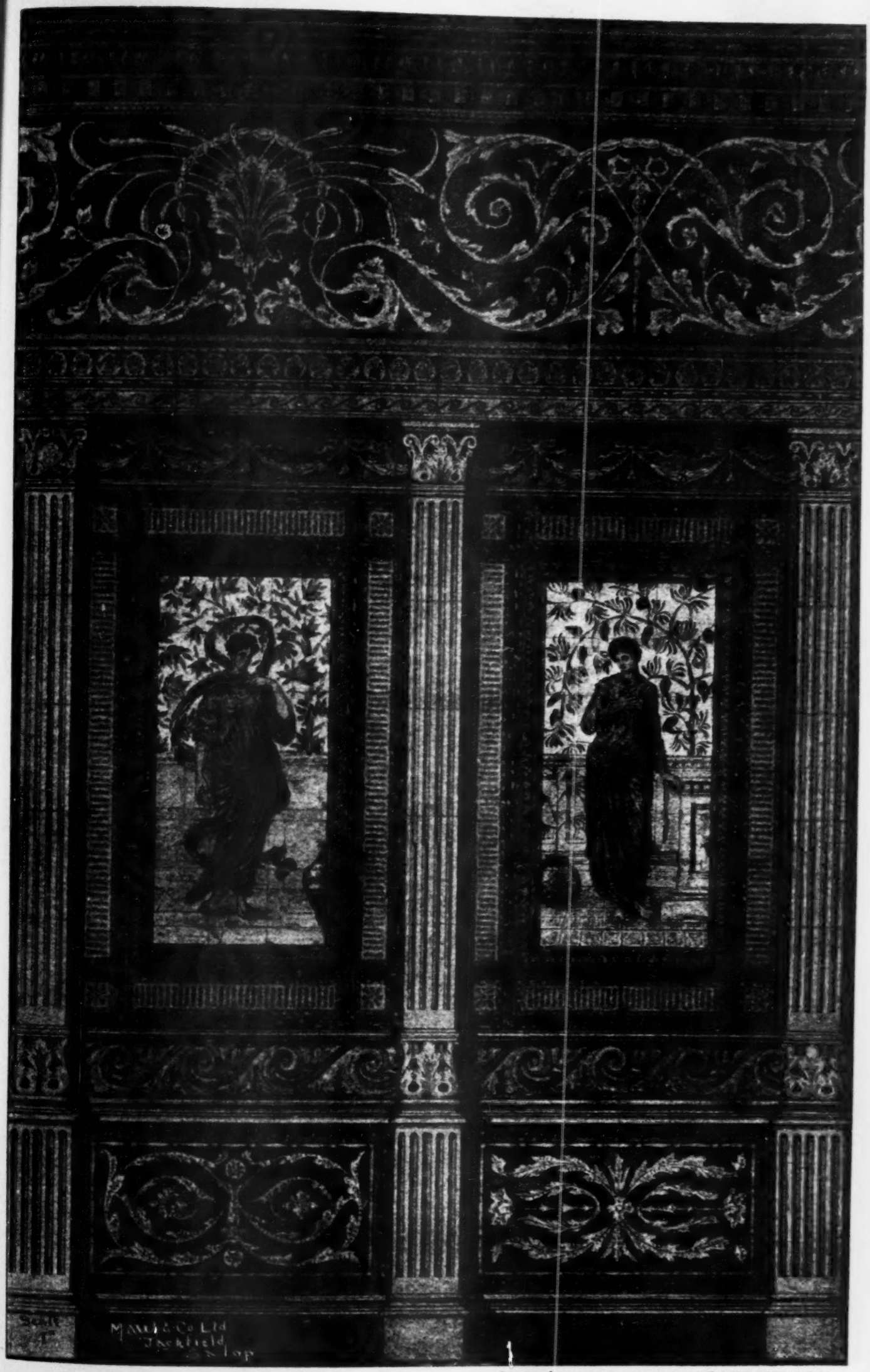
SIDE OF CASKET.



TROWEL.

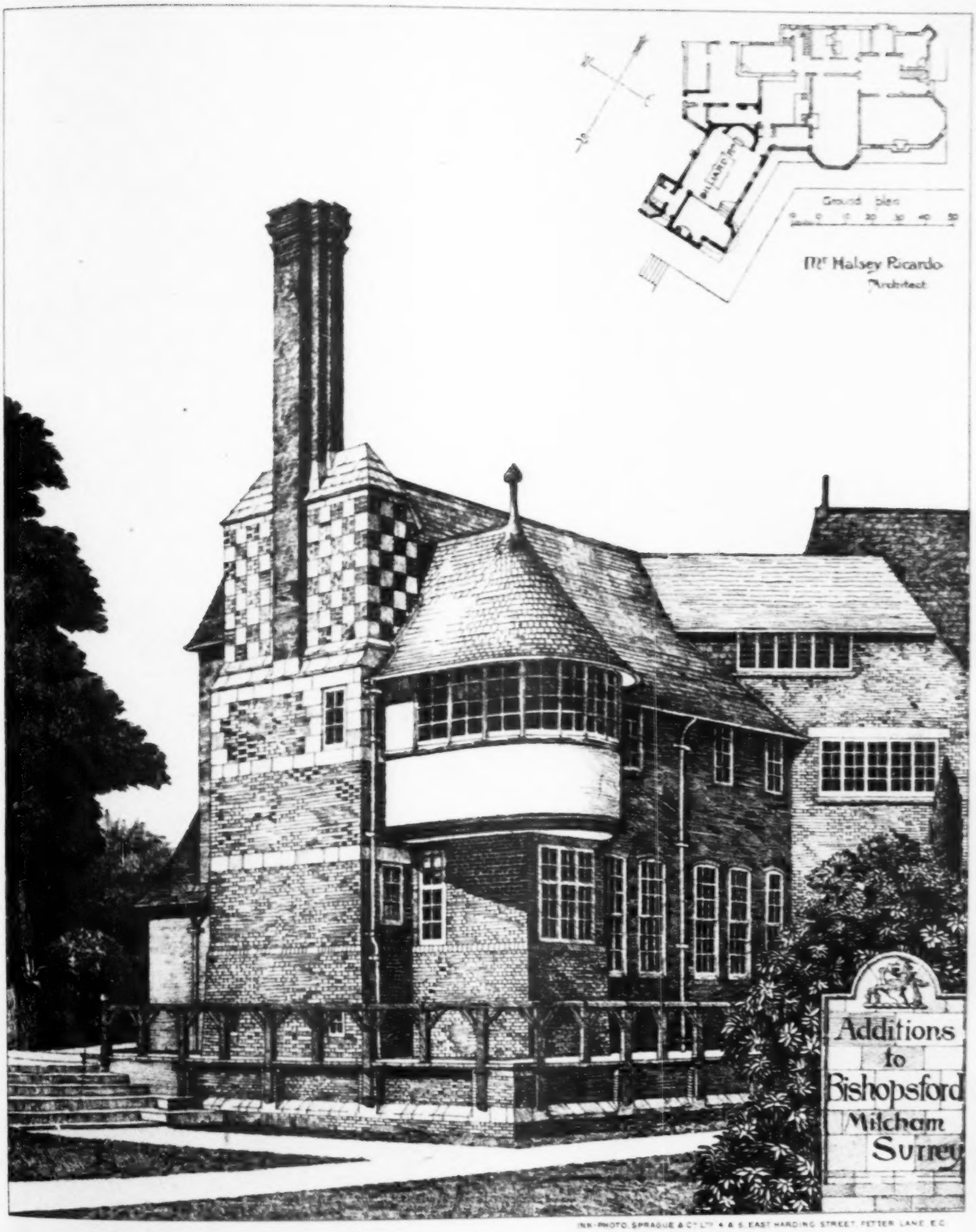
"W.R." PHOTO. SPRAGUE & CO. LTD.

TROWEL USED BY THE KING IN LAYING THE FOUNDATION STONE OF THE ROYAL NAVAL COLLEGE, DARTMOUTH: WITH CASKET FOR CONTAINING IT.



"INK-PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

DESIGN FOR WALL DECORATION OF A BATH-ROOM.—By Mr. C. H. Temple.

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tenham-court-road (Mr. G. G. Woodward for Messrs. Norman & Stacey, Ltd.)—Refused.

*Holborn.*—Wooden letters in front of Nos. 52 and 54, New Oxford-street, Holborn (Messrs. Nash & Hull for Messrs. Brown, Gould, & Co.).—Refused.

*Kensington, South.*—A studio building at the rear of No 22, Pembroke-road, South Kensington, to abut apon Pembroke-villas (Mr. G. M. Silley for Mr. G. E. Moira).—Refused.

*Lewisham.*—A porch addition at the Railway Tavern, Catford Bridge, Lewisham (Mr. A. W. Osborn for Mrs. A. Murray).—Refused.

*Lewisham.*—A building, with a shop on the ground floor, on the north side of Sydenham-road, Lower Sydenham, to abut upon Champion Park (Mr. E. Schneider for Mr. A. Hurst).—Refused.

*Peckham.*—A building on the south side of Meeting-house-lane, Peckham, westward of No. 89A (Mr. G. D. Stevenson for Messrs. C. Blyton & Sons).—Refused.

*Woolwich.*—One-story shops on the forecourts of Nos. 1, 2, and 16, Bostall-lane, Plumstead (Mr. W. A. Stratton).—Refused.

*Width of Way.*

*Lambeth, North.*—Erection of Nos. 52 and 53, Fitzalan-street, Kennington (Messrs. J. A. J. Woodward & Sons for Mr. J. Ford).—Consent.

*Whitechapel.*—Two houses on the east side of Tenter-street East, Whitechapel (Messrs. N. & R. Davis).—Consent.

*Rotherhithe.*—A granary building on the site of Nos. 51, 53, and 55, St. Mary Church-street, Rotherhithe (Mr. E. Crosse for Mr. A. Barber).—Consent.

*Space at Rear.*

*Wandsworth.*—Four houses on the north side of Replingham-road, Southfields, Wandsworth, with irregular open spaces at the rear (Mr. D. Matthews for Mr. G. A. Gale).—Consent.

*Width of Way and Lines of Frontage.*

*Lewisham.*—A building, with a bay window, on the west side of Doggett-road, Catford (Mr. O. M. Ayrton for Messrs. Eastwood & Co., Ltd.).—Refused.

*Mile-End.*—A building on the site of Nos. 51, 53, 55, and 57, Devonshire-street, Bethnal Green (Messrs. Jarvis & Richards for Mr. R. Bayly).—Refused.

*Width of Way and Space at Rear.*

*Southwark, West.*—Certain deviations from the plans certified by the District Surveyor, so far as relates to the proposed rebuilding of stables and coach-houses on a site at the rear of buildings on the south side of Lant-street, Southwark, abutting also upon John's-place (Messrs. Perry & Reed for Messrs. L. Spackman & Sons).—Consent.

*Formation of Streets.*

*Wandsworth.*—Deviations from the plans, sanctioned on February 19, 1901, for the formation or laying out of new streets for carriage traffic on the Totterdown Fields estate, Upper Tooting-road, Wandsworth, so far as relates to an alteration in the position of the street to be named Derinton-road (Mr. R. Robertson for the Housing Committee of the Council).—Consent.

*Means of Escape from the Top of High Buildings.*

*City.*—Means of escape in case of fire, proposed to be provided on the eighth story of Cocker's Hotel, Nos. 18 to 21, Charterhouse-square, Aldersgate, for the persons dwelling or employed therein (Mr. E. Haslehurst for Messrs. Wheeler & Warren).—Consent.

*Strand.*—Means of escape in case of fire proposed to be provided on the topmost story of the western portion of the Constitutional Club, Northumberland-avenue, Charing Cross, for the persons dwelling or employed therein (Mr. E. A. Gruning for the Committee of the Club).—Consent.

*Strand.*—Means of escape in case of fire proposed to be provided on the topmost story of an addition to Nos. 173 to 179, Strand, and No. 2, Norfolk-street, on the site of No. 3, Norfolk-street for the persons dwelling or employed therein (Messrs. White & Co. for the Law Land Co.).—Refused.

*Buildings for the Supply of Electricity.*

*Southwark, West.*—The re-construction in brick-work of a one-story building at the City of London Electric Lighting Co.'s premises, Bankside, Southwark (Mr. F. Bailey for the City of London Electric Lighting Co., Ltd.).—Consent.

*Cubical Extent.*

*Clapham.*—An addition to a building at Nine Elms Ironworks, Nine Elms-lane, Battersea, which building and addition will together exceed in extent 250,000, but not 450,000 cubic ft., and be used only for the purposes of a foundry and machine shop (Messrs. Z. King & Son for Messrs. H. Young & Co.).—Consent.

APPOINTMENT OF A SANITARY INSPECTOR.—The Local Government Board has sanctioned the appointment of Mr. W. Williams as a sanitary inspector in the Metropolitan Borough of Bermondsey.

## Books.

*A History of the Church of All Saints, Northampton.* By Rev. R. M. SERJEANTSON, M.A. Northampton: William Mark.

NORTHAMPTON was for several centuries one of the five chief towns of England, and the church of All Saints was its oldest and most important parochial building, and was intimately connected with various striking incidents in English history.

In these pages, however, we must look mainly to architectural particulars, or details relative to the fabric. Such notes, in this instance, are of necessity but brief, for in 1675 there occurred a fierce fire in Northampton, when most of the town was destroyed, and the great church of All Saints almost entirely perished. In the parish register, among the marriage entries of 1675, occurs the pathetic and pregnant entry:—"While the world lasts, remember September the 20th, a dreadfull fire, it consumed to ashes in a few hours 3-parts of our town and chief church."

But little can be gleaned relative to the fabric of the great cruciform church previous to the fire. It is known, however, to have undergone considerable repair or rebuilding in 1232, when the Bishop of Lincoln granted an indulgence to the contributors to the building fund. In addition to the miniature sketch on Speed's map of 1610, the only known drawing of the church previous to the fire is one in Duke Cosmo's "Travels" of 1669. It shows a large cross church, with a central tower that had evidently been much debased by seventeenth century rebuilding. We are glad to notice that Mr. Serjeantson rejects the curious forgery that appeared in all the glory of colours in a local publication issued in 1844 to celebrate the Queen's visit to Northampton on her way to Burleigh House. A picture purporting to be taken from a thirteenth century manuscript, which was as impossible a conception as certain letterpress which affected to give a contemporary account of a State visit of Queen Elizabeth, though both were in reality clumsy frauds, were actually reproduced as genuine in the *Transactions* of the Northampton and Oakham Architectural Society for 1881. The only part of the old church that was incorporated with the new and much reduced church opened in 1680 (save an undercroft or charnel house beneath the chancel) is the central tower, which now stands at the west end. This tower, which had been much damaged by a storm in 1595, is an architectural puzzle. There have been so many alterations and repairs, and the levels of the different floorings so frequently altered, that it is difficult to explain or understand the successive stages of its treatment, or to account for the unusual narrowness of the arches of the basement. The core of the piers is probably Norman, and there are obvious traces of work of the thirteenth, fourteenth, sixteenth, and seventeenth centuries. Mr. Serjeantson is probably wise in not attempting any explanation of his own, but is content to give the somewhat contradictory theories of Mr. M. H. Holding, the Rev. Dr. Cox, and the late Sir H. Dryden.

The church of 1676-80, built on the site of the old chancel, has a square plan, 75 ft. by 70 ft. internal measurement, with a small chancel. To the south and north of the tower are large chambers, the one used for a consistory court and the other for a vestry with library above. The body of the church has a fine central dome supported on four piers. The mouldings and ornaments of the plaster roof are remarkably good, and the proportions have a certain dignity. The work of the new church was accomplished by voluntary contributions all over England. The list of subscribers is preserved, but neither in the vestry books or elsewhere has it been possible to recover the name of the architect. Several guesses have been made, but they are of no authority. A great west portico, of twelve columns, extending along the whole front of the church, was added in 1701.

The original fittings of the new church included a good and well-proportioned chancel screen. A restoration of 1865-6 resulted in the unhappy destruction and removal of this screen. Most of its component parts were worked up into three entrances from the western vestibule into the nave of the church. The Church of All Saints will attract much attention at the Church Congress of next October; it would be well if the churchfolk of Northampton set to work at once to undo this grievous wrong, as far as may be, and to piece together this interesting and handsome screen from its disjointed parts.

The chancel suffered considerable further restoration in 1888, when the original plan was "improved" with doubtful success. The organ, which was placed in a west gallery built for the purpose in 1700 was unfortunately removed to the north side of the chancel in 1883; at that time, we believe, though not stated by Mr. Serjeantson, certain distinctive and good parts of the case disappeared. A more serious point, to our thinking, is the injury which must have resulted to the tone and effect of this grand instrument, from being removed from its central and open position. The author does not seem to be aware that this organ is (or was, if they have not spoiled it), one of the finest and most remarkable church organs in England, with the very unusual feature of *two* great organ manuals of equal scale and power (four manuals in all); an arrangement invaluable in a musical sense, though a very costly one. Archæologists, however, seldom trouble themselves about matters of this kind; indeed, the author's knowledge of the subject may be estimated by the fact that he mentions a considerable sum (about 130*l.*) having been expended in "several new pipes" for the organ: rather expensive pipes! It should of course have been "several stops," *i.e.* complete ranks of pipes. Mr. Thomas Shephard supplies some interesting copies of armorial glass in the old church from the Belcher MSS. of the Bodleian, and has also drawn admirable heraldic head and tail pieces for most of the chapters. Other plates and illustrations are good and useful, but we wish they had included drawings of some of the roof plaster work and details of the demolished screen. Another illustration that we have looked for in vain is that of the memorial statue of the greatest statesman ever connected with Northampton, Mr. Spencer Perceval, England's Prime Minister, shot by an assassin in the lobby of the House of Commons in 1812. A local and national subscription was raised to place a memorial of Mr. Perceval in All Saints' Church. This was accomplished in 1817, and the figure is supposed to be one of the best examples of Chantrey's work. It has since been removed from the church, a matter in regard to which, however, we do not altogether share the author's indignation. It may be questioned whether the church was the proper place for it.

*Proceedings of the Incorporated Association of Municipal and County Engineers.* Vol. xxvii., 1900-1901. London: E. & F. N. Spon. 1901.

JUDGING from the volumes now issued, the progress of the Association of Municipal and County Engineers has been well maintained. District meetings have been held at various provincial towns, and the subjects discussed included matters of much importance to the community at large. In addition, several useful papers were contributed at the annual meeting, which took place at Leicester under the presidency of Mr. E. G. Mawbey. The general programme followed at the district meetings of the Association is for the local engineer to give some account of municipal work in the town, and then to listen to the remarks and suggestions of his confrères; sometimes other papers are read; and the proceedings usually terminate with a series of visits to works of public interest. There is nothing in this routine differing materially from that adopted by other professional societies. It is reasonable to hope that more beneficial effects may result because all those present are engaged in the same department of engineering work. Consequently, interest in the subjects brought forward is better sustained, and criticism is more searching. As the volume now under review extends to over 360 pages, it is impossible for us to do more than to comment upon a few of the most important subjects dealt with. The meeting at Tonbridge had the effect of demonstrating efficiency rather than magnitude, but, as one of the speakers remarked, it was often possible for engineers to pick up useful wrinkles even from the examples of work presented by small towns. An able and instructive paper was read at the same meeting on "Electricity Supply for Lighting and Tramways, with Special Reference to Small Towns," and another of equal value on the "Main Roads of Kent." The

visit to Deal afforded to members the opportunity of inspecting the "Case" groynes, whose adoption has saved the Corporation considerable sums formerly necessary for repairing the Marina wall, for underpinning, and repairing roads in the vicinity of the sea. At East Molesey and Hampton the chief subject for discussion was sewage disposal, and as Londoners are largely interested in those places as furnishing a considerable proportion of the water supply to the Metropolis, it is distinctly reassuring to learn that no sewage effluent is better than that from the local beds. In the course of their visit to Oswestry members found many noteworthy improvements, the most interesting, from our point of view, being the extension of the market buildings, which now cover more than 2,000 yards. Several sheets of drawings, showing structural details, are given in the "Proceedings," and these will repay examination. The ancient city of Chichester, visited on another occasion, was productive of admiration for antiquarian relics to the almost entire exclusion of the more prosaic objects of the Association. The annual meeting at Leicester elicited an address from the President, dealing largely with local work, and two most comprehensive papers, one on "Permanent Way for Electric Tramways," and the other on "Methods of Safety for the Overhead Electric Trolley System." Both of these contributions are well worthy of careful attention. The final paper in the volume is devoted to "Asylums or Homes for the Insane," and its chief value is to be found in the records presented of visits to similar institutions in different parts of this country and Germany.

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*Engineering Chemistry: A Practical Treatise for the use of Analytical Chemists, Engineers, Ironmasters, Ironfounders, Students, and Others.* By H. JOSHUA PHILLIPS, F.I.C., F.C.S., Assoc.Inst.C.E. Third Edition. London: Crosby Lockwood & Son. 1902.

THIS is the third edition of a book which has become recognised as a standard work upon the analysis of constructive materials and the valuation of substances used by engineers. The book is divided into the following nine sections:—Part I.—Metals, Alloys, &c. Part II.—Ores, Limestones, &c. Part III.—Fuels, Solid, Liquid, and Gaseous. Part IV.—Water. Part V.—Oils. Part VI.—Materials used in Grease-making. Part VII.—Gasworks Products. Part VIII.—Disinfectants. Part IX.—Explosives.

The volume deals with the analysis of many building materials, but it is somewhat surprising to find no mention of cement, concrete, or mortar, as these materials are frequently used by engineers as well as by builders. The book is of too advanced a character to be of much service to elementary students, but those who have acquired a fairly advanced knowledge of chemical science will find it a useful and reliable work.

In Section VII. the portion dealing with the instructions of the London Gas Referees as to the mode of testing gas for illuminating power needs complete revision, for candles are no longer used as the standard of light, and the bar photometer has been replaced in all the official testing places by the table photometer.

The new matter added in the present edition includes a section upon the microscopical examination of iron and steel, an account of Redwood's apparatus for detecting inflammable vapour in air, and a description of several new methods of testing. We have no hesitation in recommending the book to students of analytical chemistry.

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*The Municipal Year Book of the United Kingdom for 1902.* Edited by Robert Donald. London: Edward Lloyd, Limited, Salisbury-square. Price 3s. 6d.

THIS work has again been enlarged, and it now forms a valuable and comprehensive guide to the municipal government of the country. It is impossible to do more than mention the leading features of the book, which is a model of what such a work should be. A clear and terse account is given of the municipal government of London, in which attention is drawn to the fact that London stands alone in the system of its municipal work, in that a large number of authorities are engaged in managing metropolitan affairs, but with no unity of administrative work. This does not interfere so much with the proper carrying out of municipal government as one might suppose, but it leads to some friction, and, because of the existence of so many authorities, it is less easy in London than in the large provincial towns to effect reforms. The distribution of the chief administrative work of London is indicated, and the names of the officials of the Corporation, the County Council, and of the Borough Councils are given. Very useful sections of the work are: "Municipal Government in England" (being a descriptive sketch of the government and works of large towns, with the population, rateable value, area, names of officials, &c., indicated); "Urban District Councils, England and Wales" (containing particulars of works, names of officials, population, &c.); and "Rural District Councils." The municipal government of Scotland and Ireland is dealt with separately, and in the same clear method by which the municipal government of England is treated, and the work also includes the following useful sections: telephones, water supply, gas supply, electricity supply, tramways, housing of the working-classes, and technical education, these sections in some cases including details of schemes approved or under consideration. The work is well printed and arranged, and, so far as we have been able to test it, it is up to date and reliable. There is a useful index, and no pains have been spared to make it an indispensable work of reference to the municipal government of the country.

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*The Land and House Property Year Book for 1901.* A Guide to Investments in Real Estate. *Estates Gazette* Office.

THIS is the tenth year of issue of this useful compilation, which consists of a list, under alphabetically arranged headings, of sales of property during the year, with indications by lettering of the conditions attaching to the property, whether freehold, copyhold, leasehold, with or without ground rent, &c., &c. The main portion of the book is concerned with London and suburban sales; but many of the principal country sales in the year are included in a separate division of the book. Ground-rent sales are tabulated separately.

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*Greenwood's Timber and Stone Calculator.* J. H. Kerner Greenwood, St. Ann's-street, King's Lynn; and Baxendale & Co., Miller-street, Manchester.

THIS little work is a useful collection of tables and examples that will be found principally of assistance to builders and those who deal with timber by the "Petersburg Standard;" and while possibly some may use it to a slight extent for stonework, we think the authors quite right in putting the word "stone" in such diminutive type as to make it almost unnoticeable. The tables and examples are carefully and thoroughly worked out, and the work will be found useful for its purpose.

# The Student's Column.

## PART II.—DRAINAGE.

### CHAPTER 10.—BENDS, TAPER PIPES, CAST-IRON DRAIN-PIPES, &c.

BENDS.—Inspection chambers are now generally constructed at all angles in main drains, the changes of direction being effected by means of channel bends laid in the bottoms of the chambers. Sometimes, as already stated, the drain-pipes are continued through the chambers, and in these cases access bends, such as that shown in fig. 22, will be required. The access eyes shown in figs. 23 to 25 are also made with bends.

Ordinary drain-pipe bends are made of various degrees of curvature and of various radii. The three most common forms are the quarter bend, the sixth bend, and the eighth bend, which take their names from the proportion of the circumference of a circle which they occupy, exclusive of the socket. Fig. 29 shows the three bends. It will be noticed that the quarter bend subtends an angle of 90 deg, at the centre of the circle, the sixth bend one of 60 deg., and the eighth bend one of 45 deg. The quarter bend is suitable for drains meeting at an angle of 90 deg., the sixth bend for drains at an angle of 120 deg., and the eighth for drains at an angle of 135 deg. These bends are sometimes described as bends of 90 deg., 120 deg., and 135 deg., and also as quick, medium, and slow. The "medium" bend is sometimes one-fifth of the circumference of a circle, and is therefore suitable for drains meeting at an angle of 108 deg. Bends of the same diameter are often made in three sizes, having different lengths of radius, as shown in fig. 30. As the longer bends give an easier curve, they ought always to be selected; short bends, especially quarter bends, retard the flow of sewage to a serious extent. In many cases two large eighth bends or three sixth bends can advantageously be used instead of one quarter bend.

If bends of the proper angle are not obtained, the joints will in all probability be defective. A quarter bend can, of course, be shortened to fit any drain-angle greater than 90 deg., but the pipe may easily be damaged in the operation. A sixth bend can in a similar manner be shortened to fit any angle greater than 120 deg., but if the angle is less than 120 deg., the bend can only be utilised by chipping the sides of the spigot end, and even then the spigot cannot be properly inserted into the socket. The joint, therefore, is certain to be defective. An extreme example is shown in Fig. 31, where a sixth bend is fitted to drains meeting at an angle of 90 deg.

Swan-neck bends (fig. 32) are pipes of double curvature, and are useful for fitting to the outlets of shallow gully traps, in order to take the drain to a suitable depth below the surface. The same result can be obtained by using two ordinary bends, but these necessitate an extra joint.

Lynde's "Loco" deflector bends (fig. 33) are designed for fixing under vertical soil pipes and waste-pipes, the object being to deflect the sewage into the drains with the least possible loss of velocity.

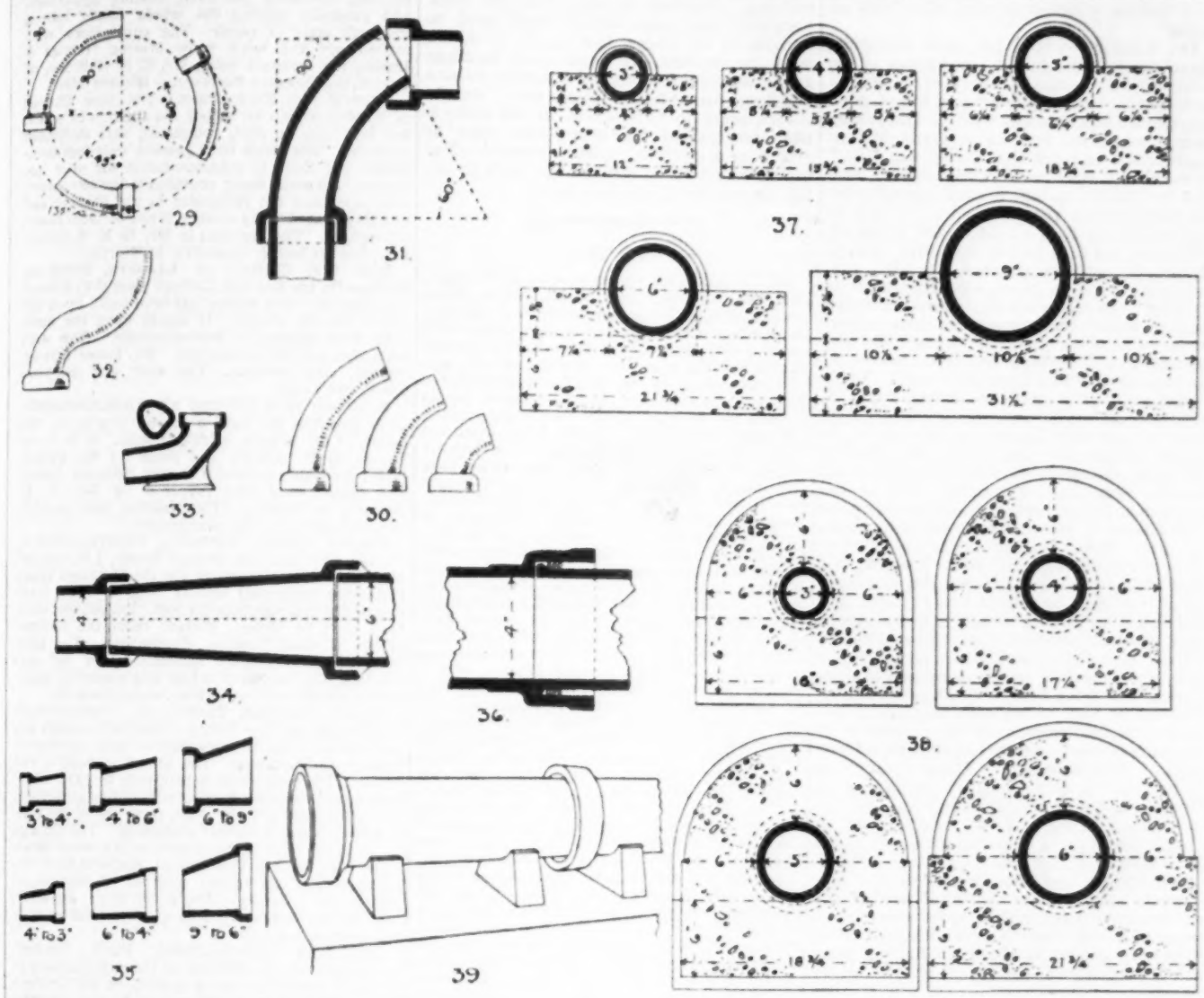
*Taper-pipes.*—Taper-pipes are of two kinds—enlarging and diminishing. Confusion often arises in ordering these pipes. If we think of the flow of the sewage as it passes from a 4-in. to a 6-in. drain, we shall be inclined to speak of the connexion as an "enlarging" pipe; if, on the other hand, we think of the order in which the two drains are laid, we may regard the connexion as a "reducing" or "diminishing" pipe. To avoid this confusion, it is always best to specify the diameters of the inlet and outlet. At the head of a drain, 4-in. pipes may be shown on the plan until as many branches have been connected with it as can safely be done; before the junction with the next lower branch is reached, the drain must be increased in size, and this can be done by introducing a taper-pipe with a 4-in. inlet and (say) a 6-in. outlet. A similar pipe may also be required at a change from a very steep to a flat gradient. Conversely, a taper-pipe with 6-in. inlet and 4-in. outlet may often be safely introduced to connect a 6-in. inlet drain of small inclination to a 4-in. outlet drain of greater inclination.

Formerly taper pipes were made with the two ends concentric with each other, as will be seen from fig. 34; pipes of this kind, with larger inlets than outlets, could scarcely be laid so that the inverts had a fall in the proper direction. The only correct form for a taper pipe of this kind is shown in fig. 35; the ends of the pipe are at right-angles to the invert, not to the axis. The same form is now adopted for pipes with the outlets larger than the inlets, in order that the inverts of the smaller and larger drains may be in the same straight line, but the advantage in this case is not as great as in the former. Taper bends are also made, but are not often required.

*Cast-iron Drain-pipes, &c.*

Some of the advantages and disadvantages of cast-iron drain-pipes have already been alluded to. The principal advantages are great strength, increased velocity of flow, absolute imperviousness, perfect joints, true alignment, and the retention of these qualities for a long period of time. The disadvantages are increased cost and liability to corrosion. A further disadvantage, where junction-chambers are not provided, is the increased difficulty of making connexions in the case of alterations to the building.

Against the extra cost of iron pipes may be set a great saving in repairs—stoneware drains seldom remain perfect for any great length of time—and also a small saving in the amount of concrete required. Thus, in London, stoneware pipes under buildings must be completely embedded in concrete at least 6 in. thick, whilst iron pipes need only to be laid on a bed of concrete or otherwise supported on piers,




brackets, &c. In many cases iron pipes can advantageously be laid in brick trenches or subways, or supported on piers or brackets, or hung from ceilings. Better gradients can thus be obtained, and the pipes can be inspected, painted, and repaired without difficulty.

It must be admitted that no method of permanently preventing corrosion has yet been invented, but there are various methods of delaying it, and even an unprotected iron pipe may, in insurance language, be regarded as a good life, as the grease in domestic sewage is itself a good preventative of rust. There is certainly much more to be said in favour of iron drain-pipes than of iron soil-pipes.

The most general mode of protection is that known as Dr. Angus Smith's; it is effected by dipping the pipes vertically into a bath containing a mixture of coal tar, pitch, and linseed oil, heated to a temperature of about 400 deg. Fahr. This adds very little to the cost of the castings, and the coating is fairly durable. The Bower-Barff process is seldom used, and need not be described. Glass-enamelling, if properly done, gives a smooth and durable vitreous coating to the interior surfaces of the castings, but unfortunately the coating is not always complete and uniform; the writer has rejected glass-enamelled pipes (supplied by a well-known firm) because patches of iron have been left unglazed, or because the glaze has risen in blisters. Glass-enamelled pipes are costly, but if the enamel is perfect when the drain is laid they may safely be regarded as more durable than pitch-coated pipes. Galvanising is not a good protection; the coating of zinc is not always complete, and at the best it is soon eaten away.

*Dimensions and Weights.*—The London Drainage By-laws specify the following dimensions and weights of cast-iron drain-pipes:—

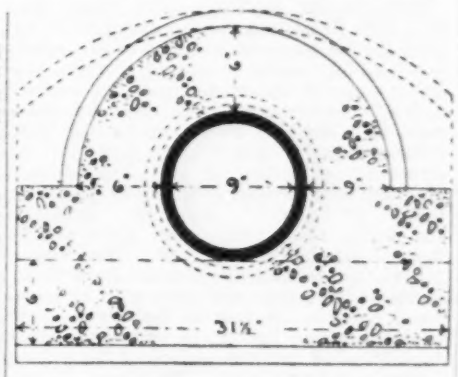
| Internal Diameter. Inches. | Thickness of Metal, not less than— | Weight per 9ft. length not less than— |
|---|---|---|
| 3 ... | $\frac{5}{16}$ of an inch ... | 110 lbs. |
| 4 ... | $\frac{3}{8}$ " ... | 160 " |
| 5 ... | $\frac{7}{16}$ " ... | 190 " |
| 6 ... | $\frac{1}{2}$ " ... | 230 " |

The weight includes the socket and beaded spigot or the flanges. Sockets must be not less than 2½ in. deep and ⅜ in. thick, and the annular space for the lead used in caulking must be at least ¼ in. wide for 3-in. and 4-in. pipes, and ⅜ in. for the larger pipes. Socket-joints must be made "with molten lead properly caulked." Flange-joints may also be used, and must be "securely bolted together with some suitable insertion." It may be said in passing that socket joints are almost invariably adopted in drainage work.

Lighter and heavier pipes than those required by the L.C.C. can, of course, be obtained, but the lighter pipes cannot be recommended. Pipes are also made in 6-ft. lengths, but these involve more labour and lead in laying than the 9-ft. pipes. Making-up lengths of any size are cast to order.

*Joints.*—The usual form of socket joint is shown in fig. 36. Three or four turns of gasket are first caulked into the head of the annular space, and the joint is completed with molten lead caulked tight with a proper tool. Sometimes neat Portland cement is used instead of the molten lead; such joints are cheaper and more easily made, but are not as satisfactory. The spigot end ought to have a half-round bead cast on to prevent the caulking material passing through the joint. For cutting pipes, wheel cutters are better than hammer and chisel, as the latter are apt to damage the casting. It is a good plan to shrink a wrought-iron ring on to the cut end of a pipe to take the place of the bead. Turned-and-bored joints are more frequently used for water-mains than for drains. They are an improved form of the socket joint, the inner half of the socket having a smaller diameter than the outer half, and being bored to a true cylindrical surface, and the thickened end of the spigot being turned to fit exactly into the bored part of the socket; the joint is completed with molten lead properly caulked.

*Fittings.*—Cast-iron junctions, bends, collars, taper pipes, &c., are now made in great variety, but many of them are on the same




general lines as the stoneware fittings already described, and therefore do not call for detailed notice. Cast-iron inspection chambers and manhole fittings will be considered in a subsequent chapter.

*Concrete Beds for Drains.*—Probably the most common cause of defective drains is insufficient bearing on the ground and consequent settlement due to the weight of the filling material or of passing loads. A circular pipe laid on the flat bottom of a trench is easily forced downwards, unless the ground is extremely firm. Settlement is still more likely to occur if the pipes are supported at the sockets only instead of along the barrels. On taking up old stoneware drains—especially those jointed with cement—it is often found that the collars have been burst off in consequence of such settlement. Hence the necessity for a firm foundation of concrete. The Urban Model By-laws specify that every drain (except subsoil drains and drains under buildings) must be "laid in a bed of good concrete" in order that a firm foundation may be obtained. In the rural by-laws, the concrete bed must be provided only "where necessary." Both the Urban and Rural By-laws require every drain passing under a building "to be completely embedded in and covered with good and

solid cement concrete, at least 6 in. thick all round."

The London by-laws are more stringent; the thickness, breadth, and composition of the concrete are specified. Every drain (except subsoil drains) must be laid "on a bed of good concrete not less than 6 in. thick, and projecting on each side of the drain to an extent at least equal to the external diameter of the drain." In the case of stoneware drains, concrete must also be "filled in so that it shall extend to the full width of the concrete bed . . . . and so that such drain shall be embedded to the extent of not less than half its diameter." Fig. 37 shows the concrete required for 3-in., 4-in. 5-in, 6-in., and 9-in. pipes, according to these by-laws. In the case of stoneware drains passing under buildings—other than subsoil drains—the pipes must be "completely embedded in and covered with good and solid concrete at least 6 in. thick all round." These "surrounds" of concrete are shown in fig. 38. Strictly speaking, the concrete ought to be 6 in. thick around the sockets of the pipes, as shown by the outer lines in the diagram, but the usual course is to allow 6 in. from the barrels. Sometimes the upper part of the concrete is formed to the shape shown by the dotted lines in the section of the 9-in. drain. An iron drain passing under a building need not be surrounded with concrete, but must be laid on a bed of concrete, as already stated, "unless it be carried above ground, and also be carried at least at each joint on adequate piers or other sufficient supports, constructed of iron, stone, brick, or cement concrete." The concrete is specified "to be composed of clean gravel, hard brick broken small, or other suitable ballast, well mixed with clean sand and good Portland cement in the proportion of two parts of sand, one part of cement, and six parts of other material." These proportions do not give a very strong or an impervious concrete, and may with advantage be improved by altering to 1½ parts of sand, 1 part of cement, and 4 parts of ballast broken to pass a screen with 1-in. meshes.

Hand-holes may be formed in the wet concrete bed to receive the sockets of the pipes and to allow space for making the joints, or—a better plan—the barrels may be supported on stoneware chairs, as shown in fig. 39, these being afterwards embedded in the upper concrete.

*Drains under Buildings.*—The Model By-laws, both Urban and Rural, specify that drains must not be constructed "so as to pass under any building, except in any case where any other mode of construction may be impracticable." In the exceptional case the drain must be "laid in a direct line for the whole distance beneath such building, and . . . . be completely embedded in and covered with good and solid cement concrete, at least 6 in. thick, all round." Concrete surrounds for drains of different sizes have already been illustrated in fig. 38. The Urban By-laws unnecessarily require the drain "to be so laid in the ground that there shall be a distance equal at the least to the full diameter thereof between the top of such drain at its highest point and the surface of the ground under such building." The same by-laws require "adequate means of ventilation to be provided in connexion with such drain at each end of such portion thereof as is beneath such building." In the Rural By-laws the word "access" is wisely substituted for "ventilation" in the foregoing clause. No difference is made in either of the Model By-laws between stoneware and iron drains.

The London Drainage By-laws insist on the concrete surrounds for stoneware drains; an iron drain, however, need not be surrounded with concrete, but may be laid underground on a bed of concrete 6 in. thick, and at least equal in width to three times the external diameter of the drain,* or may be carried above ground "at least at each joint on adequate piers or other sufficient supports, constructed of iron, stone, brick, or cement concrete." In many cases it is a great advantage to carry the drains above ground; better gradients can be obtained, and the pipes can be easily inspected, painted, cleared, and repaired. The London By-laws require a drain under a building to be laid "where practicable" in a direct line, and adequate means of access must "whenever practicable" be provided at each end of such portion of the drain as is beneath the building. Needless to say, there are comparatively few cases where bends need be introduced, or where the means of access must be omitted. If bends and junctions are absolutely necessary in any drain under a building, access-pipes, fitted with airtight covers, ought to be inserted. If the drain is laid underground the access-pipe must be placed in a chamber, usually constructed of concrete and brick, and finished with an airtight iron cover at the floor-level.

* That is to say, 10⅝ in. wide for 3-in. pipes, 14½ in. for 4-in., 17½ in. for 5-in., and 20½ in. for 6-in.

## *OBITUARY.*

MR. DOOLIN.—We regret to learn of the death, after but two days' illness, of Mr. Walter Glynn Doolin, M.A., of No. 9, Dawson-chambers, Dublin. Mr. Doolin had practised during some considerable period in that city, and was the architect of many Roman Catholic churches, convents, schools, and kindred buildings in the capital and elsewhere in Ireland. Amongst the more important works planned and designed by him we may instance the following:—The parish church, New Ross, for which a tender of Mr. A. Cullen, of New Ross, for 16,300*l.*, was accepted in May, 1895, by the Very Rev. Canon Kavanagh, D.D.; alterations and enlargement of the National Schools in Haddington-road, Dublin, for St. Mary's Church; the schools in Aughrun-street, Dublin; a residence for the Rev. C. F. Ryan at Drangan, Callan, co. Kilkenny; the Church of St. Mary of the Rosary, Nenagh, erected, at a cost of about 25,000*l.* for the fabric, after the style of the Early English period, the details being modelled in accordance with the severer type of the Cistercian abbeys in Yorkshire, and local limestone being used for the exterior structure—we published an illustration of the interior, with a plan, on December 12, 1896; a new church (1897) at Castlemaine, co. Kerry; a Roman Catholic church, dedicated to St. Brigid, at Clonakenny, Roscrea, co. Tipperary (1898-9); rebuilding of the parish church at Doneskea; the belfry, Frankford Roman Catholic Church, Tullamore; the Convent of Franciscans at Merchants' Quay; the Roman Catholic Church at Castlebar, co. Mayo, completed some twelve months ago; and the new church (built upon the site of the former Church of the Holy Cross) at Ardoyne for the Passionist Fathers in Belfast. The foundation-stone of the last-named was laid on June 17, 1900, and the church is noteworthy as being one of the largest in the North of Ireland. The plan comprises a nave, aisles, with large ritual chancel and side chapels, baptistry, Calvary chapel, and Lady chapel, and two western towers (105 ft. high), the extreme measurements are 164 ft. by 68 ft., the interior rising to 52 ft. The style is Romanesque, with a free treatment, based upon that of the Lombardic churches in Northern Italy. Mr. Doolin's designs were selected in competition, upon the award of Sir Thomas Drew as assessor; the contract was taken by Messrs. James Henry & Sons, of Belfast. Mr. Doolin was elected a Fellow of the Royal Institute of British Architects in 1899.

MR. JUDGE.—We have also to announce the death, on the 15th instant, at his residence, No. 5, Frederick-place, Gray's Inn-road, W.C., in his seventy-sixth year, of Mr. George Judge, architect and surveyor. Mr. Judge was elected an Associate Member of the Royal Institute of British Architects in 1848 and a Fellow in 1868. For the trustees acting in terms of the will of the late Mrs. H. M. Burton he was appointed to make the plans and designs for a block of working-class dwellings, for which was taken the site of Nos. 5, 6, 7, and 8, Dove-court, Leather-lane, Holborn.

## *GENERAL BUILDING NEWS.*

CHURCH RESTORATION, ST. BRIDE'S MAJOR, GLAMORGANSHIRE.—The parish Church of St. Bride's-super-Ely, has just been reopened after restoration. The church is situated in a wooded dingle, about 200 yards from the cross road, leading to St. George's from Llandaff and Peterstone. The churchyard is famous for its fine yew tree, the trunk of which is 22 ft. in circumference. The church itself is in the possession of a splendid specimen of Norman work in its south porch removed there from Margam Abbey fifty-five years ago. There is also a beautiful little niche, belonging to the fourteenth century, above the altar, but this, probably, formed part of a monastic building in the near neighbourhood. The chancel arch is a replica of the original Norman work, but, unfortunately, no traces of the original intention have been left to tell their own tale, a fact which applies also to the scale work above the south door; yet, apart from its additions, the church has an individuality of its own—the fourteenth century saddleback tower, the tower arch, and the quaint old monuments form their link with the past. One monumental tablet, in Penarth alabaster, erected to the memory of Captain Jones, bearing date 1658, is of especial interest. The east window was brought from St. Mary, Llanfair. The present work of restoration of the church includes the reparation of the tower, the addition of a vestry, wood-block flooring, re-seating the nave, heating apparatus, and generally putting the whole fabric into a thorough state of repair. The contractors who carried out the work were Messrs. Harries & Davies, the architect being Mr. G. E. Halliday, of Cardiff, the Diocesan Surveyor.—*Western Mail.*

CHURCH FOR EASTBOURNE.—The new Church of St. Michael and All Angels, the erection of which has just been, in part, completed, was dedicated recently. The work is at present only half completed, but there is accommodation for over 400 persons, 250 seats being provided in the temporary iron nave, and the remainder in the chancel and morning chapel. The church is seated with chairs throughout. The architect is Mr. G. E. S. Streatfield, and the builder Councillor M. Martin.

NEW U.F. CHURCH AT LARBERT, STIRLINGSHIRE.—On the 8th inst. Larbert East U.F. Church was opened. The edifice has been built upon the site of the old church. It stands upon the main road from Carron to Stenhousemuir. The area seats 670 and the gallery 180. Mr. James Strang, Falkirk, was architect. The cost was between 6,000*l.* and 7,000*l.*

PROPOSED NEW CHURCH AT MIDDLESBROUGH.—It is proposed to build a second church in the parish of St. Aidan's, Middlesbrough. It is to be known as St. Alban's, and plans for the edifice, which is roughly estimated to cost between 4,000*l.* and 5,000*l.*, have been prepared by Mr. F. L. Pearson, of London. The building will provide accommodation for 400 worshippers.

SUNDAY SCHOOL PREMISES, CHESTERFIELD.—On the 10th inst. Dr. George Booth, J.P., opened some new school premises for the Holywell Cross (Primitive Methodist) Sunday School. The total cost of the new buildings is 1,700*l.* The schools have been built by Messrs. Forrest, from the designs of Mr. W. Cecil Jackson, Chesterfield. The new premises will provide accommodation for 500 scholars, and consist of a hall and a suite of class-rooms, church parlour, kitchen, storerooms, &c.

SUNDAY SCHOOLS, THURNSCOE, YORKSHIRE.—On the 13th inst. the Bishop of Sheffield opened the new Sunday Schools in connexion with the Parish Church at Thurnscoe. The school is built of red bricks. The main room is 57 ft. long by 35 ft. wide, with two classrooms opening with sliding partitions. These are each 17 ft. by 13 ft. 6 in., and at the rear is a kitchen and a further classroom. The fittings in the interior are of pitch-pine, with a wood block floor. Mr. E. Isle Hubbard, of Rotherham, is the architect, and the builder was Mr. C. Wilson, of Thurnscoe. Messrs. Wright & Son, Sheffield, supplied the heating apparatus. The total cost of the erection is 1,350*l.*

CELLULOID MANUFACTORY, PORT TALBOT, GLAMORGANSHIRE.—Works for the manufacture of celluloid articles are being erected in the Dufryn Valley, Port Talbot. There are twelve separate buildings erected of brick, with slate and galvanised iron roofs. Each building is isolated, on account of the inflammable and explosive nature of the compounds used in the manufacture of celluloids. Some of the buildings are very large, one being 500 ft. in length and 56 ft. in breadth, and another 200 ft. long by 54 ft. wide. The land for the erection of the works covers 16 acres. The works are connected with the Port Talbot railway by means of a siding. The machinery is of modern character, and has been manufactured in France. The designing of the buildings has been entrusted to Mr. Frank B. Smith, C.E., of Port Talbot, and the contractors are Messrs. C. & F. Gaen, Port Talbot.

MILL, ROYTON, LANCASHIRE.—The corner-stone of buildings for the Monarch Mill Company, Longsight, Royton, was laid on the 10th inst. The architect is Mr. F. W. Dixon.

POLICE-STATION AND LIBRARY, CHAPELTOWN, LEEDS.—This building, as mentioned in our last issue, is situated at the corner of Chapeltown-road and Town-street, with a frontage of 103 ft. to Chapeltown-road, and 77 ft. to Town-street. The library and police-station blocks, although adjoining, do not overlap in any way, and are entirely separate and distinct one from another. In elevation, however, they are treated so as to form a connected group of buildings. The site is of irregular shape, and the planning of the rooms to admit of symmetrical proportions has demanded special attention. The library block is two storied where it fronts to Chapeltown-road, and one story only in the rear. The ground floor accommodation comprises entrance-porch, vestibule, hexagon hall, lending library, general reading-room, and ladies' reading-room. On the first floor a gallery and book store is provided over the lending library, and a sitting-room and other accommodation is arranged for the library staff. The basement is utilised for a large store and workroom, also cellarage for the heating apparatus and fuel. The reading-room and the ladies'-rooms are both lofty, and are lighted from the roof by means of lantern lights and clearstory windows. Polished granite columns of the Ionic order divide the large reading-room into bays, and add considerably to the internal architectural effect. Kauri pine will be largely used for the internal woodwork finishings. The Police Station block comprises the Police Station proper; a dwelling-house for the superintendent, and a Fire Brigade Station. The ground floor accommodation of the Police Station com-

prises the following:—Charge office, superintendent's office, and four cells, with arched vaulted ceilings, and both walls and ceilings walled with glazed brickwork. The cells are entered from a corridor which secures isolation, and which also communicates with the charge office. On the first floor are provided a dayroom, a small kitchen with pantry and larder, four constables' dormitories, and linen store, bathroom, and lavatory. The basement is utilised for the heating apparatus, lamproom, and coals. At the rear of the charge office a corridor conducts to a large open court or exercise ground. The superintendent's house is provided with sitting-room, kitchen, scullery, three bedrooms, bathroom, lavatory, and cellarage. The Fire Brigade department comprises an engine-house with folding doors provided with Fry's patent fittings. It is so planned that stabling for two horses can be erected at the rear of the engine-house, with communicating doors, if afterwards considered desirable. Above the engine-house is a large room of similar size, which can afterwards be utilised for a hay-chamber. The block of buildings is designed in the Elizabethan style. Externally it is faced with local Potternewton wall-stones, with Morley Moor stone dressings, and the roofs are covered with green Tilberthwaite slates. The buildings will be heated by "low-pressure" hot water, and a separate apparatus is provided for the library and the police-station respectively. Fresh warmed air will be admitted to various rooms, the outside air passing through heating and ventilating radiators. The vitiated air will be extracted by means of shafts and trunks, communicating in the case of the police-station with a Boyle's air-pump ventilator, and in the case of the library with an aspirating shaft built round the boiler-chimney, the exhaust being accelerated by means of a Blackman fan driven by an electric motor. Mr. William H. Thorp, of Leeds, is the architect of the buildings.

HOSPITAL, LIVERPOOL. — The David Lewis Northern Hospital, Liverpool, was opened on the 13th inst. by H.R.H. Princess Louise. It was built at a cost of about 120,000*l.* by the David Lewis Trustees. The new hospital fronts Great Howard-street, and covers a considerable area, including the site of the old hospital. Particular attention has been paid to ventilation, and every ward has been specially constructed with ventilating towers and verandahs overlooking the grounds. The hospital consists of one circular and two rectangular pavilions, each three stories high, and the whole will provide accommodation for 220 patients. The wards are on separate floors, each of which contains twenty-two beds, and is so equipped as to be practically a separate hospital in itself. In addition there are nine apartments for paying patients, and several wards for the isolation and treatment of certain diseases. The appliances include a Swedish gymnasium, fitted up with instruments for recovering the use of limbs stiffened by accident, a complete installation of the Röntgen-ray apparatus, a ward for the special treatment of lupus, an operating theatre, photographic and analysis rooms, and Turkish, Russian, electric, and vapour baths. All the walls and the ceiling of the children's ward are embellished with a series of familiar nursery rhymes. The out-patients' department has a separate entrance in an adjoining street, and is, in fact, distinct from the main building. In the institution accommodation is provided for sixty-six nurses, each of whom has separate quarters. Mr. C. W. Harvey was the architect. The lock, fanlight gearing, and fittings throughout the building were supplied by Messrs. Colledge & Brigden, of Wolverhampton.

NEW BATHS AND GYMNASIUM FOR DUNFERMLINE.—At a meeting on the 14th inst. of the representative committee charged with the erection of baths and gymnasium for Dunfermline, the following estimates for the various works were accepted:—Mason, James Stewart, Dunfermline, 10,166*l.*; joiners, Kinnear, Moodie, & Co., Edinburgh, 5,695*l.*; plumbers, James Inglis & Son, Dunfermline, 3,196*l.*; smiths, Redpath, Brown, & Co., Edinburgh, 2,116*l.*; slater, Robertson, Dunfermline, 653*l.*; plasterer, Cavanagh, Edinburgh, 1,390*l.*; engineers, Lowe & Son, Edinburgh, 1,727*l.*; tile-layers, Allan & Son, Edinburgh, 1,836*l.*; glazier, Lindsay, Edinburgh, 279*l.* The architect is Mr. J. Hippolyte Blanc, Edinburgh.

SCOTTISH LIFE ASSURANCE OFFICES, ABERDEEN. —New buildings are to be erected in Union-terrace, Aberdeen, for the Scottish Life Assurance Company. The building will have a frontage of 66 ft., and extend the whole depth of the site to the lane behind. It consists of four stories, with an attic floor over the front portion. The principal façade is to be carried out in Kemnay grey granite. The architects are Messrs. Sydney Mitchell & Wilson, Edinburgh.

## *FOREIGN.*

FRANCE.—M. Migeon has been appointed curator of the Department of *Objets d'Art* (Mediæval, Renaissance, and Modern) at the Louvre, in place of M. Molinier, who has resigned.——The excavations for the new buildings in connexion with the Bourse have led to the discovery of the foundations of the chapel of the ancient convent of the Filles de Saint-Thomas, founded under Richelieu, as well as some objects of interest belonging to the convent.——The old Hôtel de Ville at Toulon, decorated with sculptures by Puget, is threatened with rebuilding, and the introduction of modern sculpture which will be anything but an improvement to the ancient design.——The Municipality of Corbeil (Seine-et-Oise) has opened a competition for the building of a new town hall.——The Congress of French architects will be held this year at Paris, from Monday June 2 to Saturday June 7.——The Municipality of Paris has opened a public competition for the construction and placing of viaducts to carry the metropolitan railway across the Seine at various points.——The Société Nationale des Architectes Français has given, as the subject for its eleventh competition, "Une Maison Maternelle."——A law passed on the 12th inst., has extended to the works of sculptors, architects, and decorative designers the protection conferred by the law in regard to "Propriété Artistique et Litteraire."——The "Société de Peintres et de Sculpteurs" has opened in the Georges Petit Gallery its third exhibition, which is a very brilliant one. Among its best features are the still-life pictures by M. Jacques Blanche, and a set of fine and powerful sketches of Breton subjects by an English artist, Mr. Brangwyn. M. Henri Martin has shown himself as successful in landscape as he has been in decorative and imaginative design. The exhibition includes also sculpture by MM. Meunier, Camille Lefèvre, Dejean, Desbois, and a "Temptation of St. Anthony" by M. Rodin.

HOLLAND.—A stained-glass window has recently been unveiled in the Anglican Church at the Hague. It was presented by Mr. Seth Low, United States delegate to the Hague Peace Conference. The window, which has four lights, represents Christ, and the allegorical figures of Faith, Hope, and Charity. Below is inscribed, "An American Memorial of the International Conference of Peace, 1899."

## *MISCELLANEOUS.*

GOOD FRIDAY WEEK.—In consequence of the Easter Holidays, next week we go to press a day earlier than usual. All communications for the Editor must reach him by *first post on Wednesday morning*, except lists of tenders, which will be received up to 10 a.m. of the same day.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS. —The London office of the Great Western Potteries and Brick Works has been removed from 11, Queen Victoria-street to 171, Queen Victoria-street, E.C. Mr. F. H. Brook has been appointed London agent for the company.——Mr. H. F. Parshall, consulting engineer, has removed his offices from 8 Princes-street, Bank, to Salisbury House, London Wall, E.C. ——The offices of the Builders' Benevolent Institution are removed from 35 Southampton-row to 31 and 32 Bedford-street, Strand, W.C. —— Mr. Owen W. Davis, architect, has removed from 27, Rutland-street, Hampstead-road, to 41, Pennard-road, Shepherd's Bush, W.

ELECTRIC LIGHTING, NEWCASTLE. — A Local Government Board inquiry was held recently at the Town Hall, Newcastle, by Mr. A. A. G. Malet, M.Inst.C.E., into the application of the Town Council for sanction to borrow the sum of 8,615*l.* for the purposes of electric lighting. Mr. Clirehugh, of the firm of Messrs. Lacy, Clirehugh, & Sillar, consulting engineers, of Manchester and London, submitted a report and estimates of an electric lighting scheme for the borough. There was no opposition to the application.

CO-OPERATORS AND THE HOUSING PROBLEM.—A joint conference of co-operators and trades-unionists, convened by the Committee on Production and the north-western district of the Co-operative Union, was held at Lancaster on the 8th inst. A paper was contributed by Mr. W. H. Brown, of Stratford, London, on "The Next Step in Co-operative Production." The paper advocated the complete industrial independence of co-operation, and mentioned that within the co-operative movement no fewer than seven millions had been spent in housing members. Of the millions advanced to members to purchase their houses practically the whole amount had been paid to private firms, and the question propounded was, "Ought we not seriously to advise co-operators to tackle the building trade?" It was suggested that federated builders' societies might be started in districts where distributive stores are thickly clustered. Just as co-operation had raised the standard of living, so it would raise that of building. Several speakers urged that before such a scheme could be successful an understanding must be arrived at with trades-unionists as to what constituted a fair day's work for a fair day's pay. A reference to the alleged "ca' canny" principle called forth the protests of several workmen's representatives.

A SUGGESTED WORKS DEPARTMENT FOR BRADFORD.—At a recent meeting of Bradford City Council, Mr. A. Tuke Priestman moved: "That it being desirable that the Council should, whenever possible, execute all works required to be carried out by the Corporation without the intervention of a contractor, a Works Department be constituted for the purpose; and that it be an instruction to the Finance and General Purposes Committee to appoint a special sub-committee to draw up a scheme on the model of the London County Council Works Department, and prepare the requisite resolutions for amending the Standing Orders of the Council." Mr. Priestman described the operation of the Works Department in London, and said that it had done all its contract jobs within 2 per cent. of the estimates, and saved some 11,000*l.* on the scheduled value of the works undertaken. Mr. C. L. Robinson seconded the resolution. Mr. H. H. Spencer proposed an amendment to the effect that it be an instruction to the Finance Committee to appoint a sub-committee with authority to obtain all the information possible with regard to the working of the London County Council Works Department. Mr. Spencer said he considered that this was the most important subject that had come before the Council that day. It was most advisable that precise information should be obtained. The resolution meant that the Corporation was going beyond the administration of monopolies into the field of private competitive trading. So far as he had been able to ascertain, the net effect of the operations of the London Works Department was that the jobs had been done at about the same prices as the contractors would have done them; they had done them as well, but no better, and paid the same wages, but not higher. The result was that the contractors' profits had been lost, and something, therefore, had been lost to the country. Mr. Jowett asked if Mr. Spencer would include other places besides London. Mr. Spencer replied that he would include other places, and on the mover and seconder of the resolution agreeing to accept the amendment, it became the substantive resolution and was adopted.

WAKEFIELD CATHEDRAL EXTENSION. — Some interesting discoveries have been made during the past few days in the course of the erection of the extensions at the east end of Wakefield Cathedral. Besides making an extension of the existing chancel, and adding a Lady Chapel still further to the east, vestries and a chapter-house are being constructed below the level of the churchyard. This work had so far progressed that it had become desirable to complete the corridor, which gives access to the chapter-house from the church on the one hand and the churchyard on the other. To do this a large amount of earth which was untouched by the preliminary excavations was removed from about the foundations of the remains of the east end. While this was being carried out a few days ago the workmen came upon some walling, which may have been the foundation of an earlier church on the same site. The wall is of the roughest kind, with wide joints between the stones, and it is consequently very difficult to form any accurate estimate of its age. But its face, which can be traced for about three yards, follows an entirely different line from the perpendicular wall which partly stands upon it, and it is noticeable that the stones are entirely unworked, and that there is not a vestige of the remains of any destroyed building among the stones of this lower walling, while such remains are frequent in the perpendicular wall above. The supposition that the rough wall is of very early date is, therefore, probably well-founded. Close by the remains of an old lime-kiln were found, and actually within the remains of this kiln was a very finely worked stone of Norman date. This stone may either have been a portion of an abacus of a column, or may, more probably, have formed part of a string-course. Only one face is carved, and that bears an admirably-executed design characteristically Norman in character, and very much resembling that on the abacus of a column in the White Tower of the Tower of London—figured and dated A.D. 1080 in "Parker's Glossary of Architecture." There was, it is known from "Domesday Book," a church at Wakefield in Saxon times, and it is believed by Mr. J. T. Micklethwaite, from evidences found in Sir Gilbert Scott's restorations, that it was rebuilt more or less completely "some time in the half-century of which the year 1100 is the middle." This stone is clearly of that date, and while it confirms Mr. Micklethwaite's supposition, it gives an interesting clue to the elaboration of the structure.—*Yorkshire Observer.*

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST.—At their recent annual general meeting the governors announced their intention to expend from 8,000*l.* to 9,000*l.* in providing a nurses' home within the hospital precincts, where better accommodation for the nursing staff is urgently needed. The hospital, founded by the efforts of the late Prince Consort, was opened fifty years ago in a range of buildings planned and designed by Ordish after the then uncommon "Queen Anne" style, with a central campanile. The sanatorium was designed by, it is stated, Sir Joseph Paxton.

ROYAL HOSPITAL FOR WOMEN AND CHILDREN.— An appeal is made for contributions towards a sum of 16,000*l.* which is needed to complete the estimated cost, 25,000*l.*, of the proposed rebuilding, with an enlargement of the site, of the hospital in Waterloo Bridge-road. The institution was originally founded, in 1816, in Doctors' Commons, whence, seven years afterwards, it was removed to its present situation on land owned by the Duchy of Cornwall. At a meeting of the Court of Governors held a few days ago it was announced that the Duchy of Cornwall had consented to sell the freehold of the new site before the current leaseholds shall have come into its possession.

REBUILDING IN OXFORD-STREET.—We understand that Mr. R. F. Atkinson and Mr. A. J. Gordon

are the architects, jointly, of the premises which are now being built for Messrs. Warings on the north side of Oxford-street, on the sites of Nos. 164-82 (even), with return frontages to Castle-street East, Winsley-street, and Binstead-street. Meanwhile we may congratulate all parties concerned upon the hoarding that has been erected along the Oxford-street front, and is similar to that which was lately set up before "Gillows," further westwards. It presents an excellent, albeit simple design, appropriate for a temporary wooden structure and embodying plain panels tastefully outlined and coloured, which are undisfigured by any "posters" or similar vulgar placards. We can but hope that so successful an innovation will find many imitators in the future.

MANCHESTER MARKET-STREET AREA.—On Thursday last week the House of Commons rejected by 179 votes against 102 a motion for the second reading of the Bill for carrying out the proposed improvements on the Market-street area, in Manchester. Mr. Crawford Smith moved the rejection of the measure on the ground that it involved a very great principle—which, if approved, might hereafter be extended to other cities—of empowering a syndicate to acquire private property on terms based upon compulsory purchase. Mr. Galloway urged that no private syndicate should be entrusted with what was the obvious duty of a municipality, whilst Sir James Fergusson advocated a reference of the Bill to a Select Committee, representing that it was supported by most of the members of Parliament for Manchester and Salford, as well as by the Corporation and the citizens of Manchester.

THE COURT OF COMMON COUNCIL.—At their half-yearly meeting on Thursday, March 13, the Court accepted the resignation of Mr. Henry Montague Bates, principal clerk of the Public Health Department, to which office he was appointed when the City Commission of Sewers was absorbed a few years ago. Mr. Bates, who retires at the age of fifty-three with a pension of 1,200*l.* per annum, as fixed by the Act for amalgamating the City Commission of Sewers with the Corporation, entered the service of the former twenty-seven years ago, and in course of time became their chief clerk.—The Court resolved to contribute 500*l.* in aid of the funds of the City and Guilds of London Technical Institute at Kensington, to expend 4,000*l.* in buying the freehold site, about 5½ acres, of a recreation ground for the City of London School, towards which purchase old pupils have subscribed 1,850*l.*, and a sum not exceeding 5,800*l.* out of the Sessions House rebuilding fund in the erection of a temporary prison in Old Bailey; they also agreed to the building, at an estimated cost of 24,240*l.*, of a new police-station in Moor-lane, Cripplegate Without. At the same meeting was read, with grateful acclamation, a letter written by Mr. Gerald Buxton announcing his purchase of the manorial rights over Theydon Bois, comprising waste lands along Ivy Chimnies-road with the greater part of Bell Common, and offering the lands to the Corporation as an addition to Epping Forest.

SELL'S DICTIONARY OF THE WORLD'S PRESS.—The issue of this work for 1902 (published by Mr. Henry Sell, 167, Fleet-street, E.C.), contains several interesting articles in addition to the information which one expects to find in a newspaper press guide. Among these we may mention the following, which may prove of interest to our readers:—"Two Centuries of Daily Journalism"; "an illustrated article on the Crown Colonies of the Empire, their Governments, Education Systems, and their Industries"; an "Anecdotal History of Journalism"; "A Glance at the Comic Papers of the Victorian Era;" the year's "Newspaper Happenings," &c. The work has been brought up to date, and is well arranged and edited. The thumb-index gives at once first the index, then the London papers, the English provincial papers, the Irish papers, the Scotch and Welsh papers, the magazines, and, lastly, the Colonial and principal foreign papers. An interesting and useful section of the work is that devoted to British Dominions beyond the seas. In the work particulars are given of every town throughout the British Empire in which a paper is published, together with particulars of the principal papers themselves. In regard to the papers of the British Isles the name is given of every town and village in which a paper is published, the market days, distance from London, &c. The total number of papers in the British Isles is now 2,532; of these London is responsible for 554. The number of magazines is 1,562, while there are 209 quarterly reviews of every kind.

## *CAPITAL AND LABOUR.*

PERTH PLASTERERS ON STRIKE.—On the 10th inst. about thirty of the Perth plasterers came out on strike. Some time ago the master plasterers intimated a reduction of ½d. on the wages of the men, bringing them down to 8d. The result was that the men came out on strike. A compromise was made that the wages would not be reduced till March 10, and the men restarted work on the old terms—8½d. an hour. On the 10th inst., however, the men again came out on strike. A meeting was held in the forenoon, but nothing definite was done.

ARBROATH MASONS' WAGES.—The master masons of Arbroath have had under consideration a request by the men to increase the rate of wages from 8d., as at present, to 8½d. per hour; also to allow the men to cease work at noon on Saturdays during the winter months instead of one o'clock, as at present; to grant an extra ½d. per hour on jobs outside the burgh boundary up to two miles distant, and 1d. beyond two miles. The masters have declined to entertain the request on the ground that the present state of the building trade does not warrant any alteration on the existing arrangements.

## *LEGAL.*

### THE LONDON BUILDING ACT:

#### WINDOWS IN HABITABLE ROOMS.

ON Thursday, the 6th inst., Mr. Haden Corser, at the Worship-street Police-court, gave his decision in the case of eight adjourned summonses which had been taken out by Mr. Arthur Crow, F.R.I.B.A., the District Surveyor of Whitechapel, against Mr. Nathaniel Davis, of the firm of N. & R. Davis, for non-compliance with certain notices served under Section 70 of the Act. The cases were heard by his Worship on February 20 and 27, and on February 28 he made an inspection of the premises. Mr. D. Palmer Andrews, of the Solicitors' Department, London County Council, conducted the case on behalf of the District Surveyor, and Mr. Alexander Glen, instructed by Messrs. Woodcock, Ryland, & Co., appeared for Messrs. Davis.

Mr. Andrews stated that Messrs. Davis were the builders and owners of a row of shops and houses known as Nos. 9 to 27, Short-street, Sandys-row, which were erected during the early part of last year. The original intention, as stated in the notice to the District Surveyor, was to build houses without any basements, but on its being found necessary to make deep excavations in order to obtain a proper foundation Messrs. Davis changed their minds and told the District Surveyor that they intended to form cellars. When the buildings were approaching completion it was found that, instead of cellars, the basements were being fitted as kitchens and sculleries, and that the only provision for lighting the former was by means of pavement lights and glazed sashes in the lower part of the shop-front under the stall-board. Thereupon notices of irregularity were served upon Messrs. Davis on the ground that "the windows to the habitable rooms in the basement were not of the nature and description required by Section 70." Upon the houses being let it was found that the basements were being used as living-rooms, and the present proceedings became necessary. In order to show what the Legislature thought to be a proper method of lighting and ventilating underground rooms, Mr. Andrews drew the attention of the Magistrate to the provisions of the Public Health Act, which required that underground rooms, where separately let as dwellings, should have an open area of 6 ft. wide running the full length of the external wall, and that the level of the ceiling should not be less than 1 ft. above the level of the adjoining ground. These provisions, however, could not be enforced as the rooms were not separately let.

Mr. Crow gave evidence in support of Mr. Andrews' opening remarks. He said that, strictly speaking, there was no window in the rooms at all. The sashes in the lower part of the shop-front were really in the shop, and the light was conveyed to the room below through an opening in the shop floor, the opening being enclosed by a bulkhead formed of thin boards under the stall-board of the shop. Assuming that these sashes could be considered as forming a window, in the room below the superficial area of the glass was only about half of that required by the Act, viz.—11 ft. 10 in. instead of 21 ft. 6 in. The area of the room was 215 ft. The area of the part made to open was 11 ft. 6 in. There were many grounds of objection to the method of lighting adopted. The bulkhead enclosure made it impossible for any direct light to reach the back part of the rooms. Standing in the middle of the room it was impossible to see any window at all. Further obstruction would be caused by the display of goods on outside stall-boards, which was a prevalent custom in the district. The height of the sashes rendered it almost impossible for the tenants to open them, except with the aid of a pair of steps or by a chair placed upon the table. The fastening was 9 ft. above the floor. Except on one occasion he had never seen any of the sashes open. In the case of the two end houses, which also had habitable basements, the open space of 100 ft. required by Section 40 had not been provided. On inspecting the premises in January last he had found that the basement of one of the corner houses was used as a living-room. The range and dresser had now been removed to a room at the rear, which was lighted only by a pavement light.

In reply to Mr. Glen, who contended that this little place was only a scullery, Mr. Crow pointed out that it was 12 ft. square, and being now provided with a range, dresser, and sink, it had all the appurtenances necessary for its use as a living-room. He could not see that the term "scullery," which had been applied to it, rendered it less capable of being used as a habitable room.

Mr. Glen, on behalf of the defendant, said the question was of importance, as other buildings would be affected by the decision in this case. Section 151, under which the Notices of Irregularity were served, referred to the construction of the building. The owner was not responsible for the improper use of the building by the tenant. The basement-rooms in the corner houses were not intended for habitable rooms, and the casual use of such for cooking purposes did not bring them within the Section. He admitted that the rooms in the middle houses were habitable rooms, and contended that the pavement lights were lights in the ceiling.

The Magistrate, interposing, said that a light in the ceiling was not a window. A window was a glazed opening in a vertical wall.

Mr. Glen said if that were the Magistrate's ruling then he must admit they had not got the proper area of light, and the only question left was as to whether the window under the stall-board was a window of or belonging to the basement room, or did it belong to the shop? If the bulkhead was brought up close he could not consider the window as belonging to the room. It was a question of degree as to how far the bulkhead could be placed away from the window. If these windows were windows of the basement-rooms they would enlarge them; otherwise they must abandon the use of the basements as living-rooms. He contended, however, that the windows as constructed satisfied the intentions of the Legislature.

The tenant of No. 9, Short-street was then called, and stated that he was by his agreement debarred from using the basement as living-rooms. He admitted, however, in cross-examination that on the Friday when Mr. Crow called a little extra cooking was being done in the basement. He further admitted that the kitchen on the first floor was used as a bedroom. The range and dresser were moved into the scullery by Mr. Davis's men after Mr. Crow's visit on January 24. The dresser was now used for storing buttons. A blower had been fixed to the range since it was moved, but the range was not used.

The Magistrate, in giving his decision, said the sole question he had to determine was whether the windows came within Section 70 of the Act. The Section required that "Every habitable room shall have one or more windows opening directly into the external air or into a conservatory with a total superficial clear of the sash-frames free from any obstruction to the light equal to at least one-tenth of the floor area of the room, and so constructed that a portion equal to at least one-twentieth of such floor area can be opened, and the opening in each case shall extend to at least 7 ft. above the floor level; but a room having no external wall or a room constructed wholly or partially in the roof may be lighted through the roof by a dormer window. . . . or such room may be lighted by a lantern light," &c., &c.

He had no doubt these rooms were "constructed or adapted to be inhabited," and therefore were "habitable rooms" by definition. They were furnished with a cooking range and dresser, and it was abundantly clear that the rooms were intended to be occupied as living rooms. The method of lighting these rooms was partly by means of pieces of glass let into the pavement and partly by sashes made to open under the stall-board of the shop window. With regard to the former he must decide that they were not windows, as in the absence of any definition in the Act as to the meaning of the word "window," he should adopt the ordinary meaning attaching to it in every-day life, viz., an opening in an external wall. There were three ways in which a room might be lighted—(1) by a window in an external wall; (2) by a dormer window; and (3) by a lantern light. Referring to the drawing, he found that the rooms had an external wall under the pavement, but it could not be said that this wall extended upwards above the level of the ceiling of the room. The sashes under the stall-board of the shop-front could not therefore be considered as windows in the external wall, and he must rule that they were not windows within the meaning of the Section. With regard to the corner houses, which were similar in construction and which had been let upon the understanding that they should be used for storage purposes only, as they had no air space at the rear, but which Mr. Crow had stated in his evidence were used as habitable rooms, it appeared that the range and dresser had been removed to a small room at the back which had no window opening into the external air at all. He must find that these also were habitable rooms and did not comply with the requirements of the Act. He must therefore make the order asked for, viz.: That the notices served by the District Surveyor be complied with within eight weeks, and he would allow six guineas costs.

### ACTION BY AN ARCHITECT.

IN the King's Bench Division, on the 15th inst., Mr. Justice Bucknill delivered a considered judgment in the case of Howarth *v.* Gardner and another, the case having been heard before his lordship at the Manchester Assizes.

His lordship, in giving judgment, said the action was brought by Mr. Herbert Howarth, an architect

and surveyor carrying on business at Morecambe against Mr. John Gardner and Mr. John Scott, proprietors of the Alhambra Palace, Morecambe, to recover 379*l*. The amount claimed was the balance alleged to have been due for professional services in connexion with the erection of the Alhambra Palace. Defendants denied that there was anything due, and counterclaimed for damages for alleged negligence. It appeared that in the summer of 1899 the defendants acquired the West End Market at Morecambe for the purpose of erecting a music-hall above a market. In the course of the erection certain alterations were made, and the building when completed was a theatre instead of a music-hall. The total cost of the building was 25,770*l*., including 1,579*l*. for electric plant, 1,050*l*. for furniture, &c., and 2,585*l*. for decorations. His Lordship said that, having carefully considered the evidence given at the trial, he came to the conclusion that the plaintiff was entitled to recover from the defendants 1,312*l*., less 1,160*l*. which had been paid on account. He also was of opinion that the defendants had failed on their counterclaim, and judgment would be, therefore, for the plaintiff for 152*l*. on the claim, and also on the counterclaim, with costs.

## ACTION AGAINST THE FINCHLEY URBAN DISTRICT COUNCIL.

THE case of the Finchley Electric Light Co., Ltd., *v.* the Finchley Urban District Council came before Mr. Justice Farwell in the Chancery Division on the 17th and 18th inst.

Mr. C. E. Jenkins, K.C., and Mr. Buckmaster appeared as counsel for the plaintiffs, and Mr. W. H. Upjohn, K.C., and Mr. Chubb for the defendants.

Mr. Buckmaster said the case raised an important question. The relief sought in the action was an injunction to restrain the defendants from cutting the wires of the plaintiff company that stretched across the roads that were within the area of the Urban District Council. The facts were shortly these:—The plaintiff company was incorporated under the Companies' Acts, and formed for the purpose of supplying electric light and power. The company had no Provisional Order from the Board of Trade, and had no sanction whatever from any authority. It was simply a private trading company acting under the powers conferred by the Companies' Acts. It appeared that the defendants obtained, in 1898, a provisional order from the Board of Trade enabling them to supply electricity to the inhabitants of their district, an order which, when the plaintiff company began to work, the defendants had wholly failed to act under. They had taken no steps to avail themselves of the advantages they had got, and there was no firm or person supplying electric light to the inhabitants of Finchley. The plaintiff company was incorporated in 1899, and immediately after its incorporation it set to work to supply electric light to the inhabitants of the district. For this purpose one of the first things they did was to lay mains down Cavendish and Stanhope-avenues which were not vested in the defendants and over which they had no control. The plaintiffs laid the mains down the footpaths adjoining the roads instead of down the middle of the roads, and, having done this, they were met at once by the defendants, who said they declined to take in any of those roads if the mains were laid down in that way. They insisted on the plaintiffs laying the mains down the middle of the roads, and not down the footpaths. It appeared to be an extraordinary objection, but the reason was that the defendants desired, when opportunity arose, to avail themselves of the footpaths. What the defendants had done was not done simply for the purpose of benefiting the inhabitants of the district at all, but they had treated the plaintiff company as rival traders and attempted to do all they could to hinder their enterprise. If he (counsel) showed that from beginning to end the defendants had deliberately attempted to prevent the plaintiff company from carrying on business they would be entitled to an injunction to restrain that wrong being done to them. The plaintiffs further claimed damages. After this question had arisen with regard to a private road, the plaintiffs were in a rather difficult position. They had got to cross a road of the defendant Council, and without the consent of the defendants they were unable to open any roads in their jurisdiction for the purpose of laying their mains. What they did on one occasion was this—they obtained a license to open a road for the purpose of laying a water-pipe, and the water-pipe was laid, but while it was being laid they also laid the electric main. That appeared to have aggravated the defendants extremely, because once the main was laid they could do nothing. The defendants then started proceedings against the plaintiffs to restrain them opening any road in their jurisdiction without giving notice to the defendants of their intention, and a motion was made in that matter asking for that relief. That case was ultimately settled upon the terms that the plaintiffs would give notice before seeking to break open the roads, and each party paid their own costs. That was shortly the effect of the settlement. The provision introduced into those terms was that the plaintiffs should give notice to the defendants before they broke up the roads, so that the defendants might grant the leave, but that the defendants did not certainly intend to do. The result was that the plaintiffs were paralysed in carrying on their business. They could not carry their wires where they ought to be, viz., underground, and it was difficult to carry them overhead, but the plaintiffs carried on their business by putting the wires overhead. In the autumn of last year the plaintiffs proceeded to supply a customer by carrying a wire across a road known as the Regent's Park-road. This was done on September 28, 1901. The defendants objected to this, and gave notice that if any wire was placed above ground or across any street without the express consent of the Council, the Council would recommend forthwith to have the wire removed. In asserting that right the defendants were evidently under the impression that the plaintiff company derived its powers under the Electric Lighting Act of 1888, and if that were the case there might be some ground for their action. But the plaintiffs did not derive any of their powers from this statute at all. Therefore, the wire was stretched across the road, and in due course the customer would have been served with the light, but the defendants, on October 1, had the wire cut in two, and asserted that they would do the same thing to any other wires which were stretched across any other road in their jurisdiction. The result was the present action. A motion was made towards the end of the Long Vacation, which came before the Lord Chief Justice, to restrain the defendants cutting this wire or any other wires across the roads in the defendants' jurisdiction till the trial. That motion was resisted on the ground that the Statute of 1888 gave the defendants the right to prevent the crossing of the roads with the plaintiff's wires, but this defence failed, and the learned judge granted the injunction till the trial. Pleadings were then delivered, and the defendants then asserted for the first time the position that the road across which this wire was stretched was a road the fee simple of which was vested in them. Of course, if that were the case the plaintiffs would at once be defeated, because the reason why they could carry their wires across a road vested in the Urban District Council was because the soil was not vested in them. If the soil was vested in defendants with regard to this road across which this particular wire was stretched, the plaintiffs would be wrong. The dispute in this case turned on the question as to the ownership in fee simple of the Regent's Park-road. The defendants asserted that the fee simple of that road was vested in them as being the road authority for the time being having jurisdiction over it, and by virtue of divers public statutes. The onus of proving that they were the owners in fee of the soil rested on the defendants. *Prima facie* the soil was not vested in the defendants at all. He should leave it to the defendants to establish how they made their title out.

Mr. Upjohn argued that the freehold of the street in question belonged to the defendants, and cited a number of public statutes dating from the seventeenth century, as well as calling the attention of the Court to a number of ancient documents in support of his contention. He submitted that the defendants had the right to prohibit the plaintiff company from taking their wires across the street.

His lordship, after dealing at some length with the points of law involved, said that under the circumstances he must hold that the land in question was acquired and was still required for the purposes of the street, and the plaintiffs therefore had no right to take their wires across that portion of the atmosphere above the piece of land which belonged to the defendant Council without their consent. Therefore the claim for an injunction in respect of that piece of land fell to the ground, but under the circumstances of the claim put forward and the fact that an injunction was obtained by the plaintiffs against the defendants, he thought the justice of the case would be met by directing that there should be no costs. His lordship accordingly directed that the action should be dismissed without costs.

## IMPORTANT BUILDING CASE IN THE COURT OF APPEAL.

THE case of *in re* an arbitration between Ford & Co. and Bemrose & Sons, Ltd., and *in re* the Arbitration Act, 1889, came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Romer and Mathew, on the 15th and 18th insts., on the appeal of Messrs. Bemrose & Sons, Ltd., from the judgment of a Divisional Court of King's Bench, consisting of Mr. Justice Kennedy and Mr. Justice Phillimore, dated April 30, 1901. The case was reported in the issues of the *Builder* of May 4 and 18, 1901.

Sir Edward Clarke, K.C., the Hon. Alfred Lyttelton, K.C., and Mr. Coventry appeared for the appellants; and Mr. English Harrison, K.C., and Mr. Hudson for the respondents.

Sir Edward Clarke, in opening the case, said this was an appeal from the judgment of the Divisional Court on a special case stated by Mr. Vigers, the arbitrator, to whom certain matters had been referred in connexion with a building contract. The question of law raised by the case was a very important one, although the facts could be shortly stated. The learned counsel then read the special case which had been stated by Mr. Vigers, the material parts of which were as follows:—At some time prior to the date of the contract dated May, 1895, Messrs. Bemrose instructed Mr. Ernest R. Ridgeway, an architect, of Long Eaton, to prepare on their behalf plans for the erection of certain works in Park-street, Canal-street, and Carrington-street, Derby, and to invite tenders for the execution of such works. Mr. Ridgeway prepared the plans and invited tenders upon such plans and certain conditions of contract and bill of quantities, and with such tender furnished a schedule of prices. Such schedule of prices was for the purpose of determining the amount to be paid or allowed in respect of any alterations or deviations from the original plans which might be determined upon during the progress of the works, and the prices in the schedule were the prices referred to in the contract as the prices upon which the contract was based. Messrs. Ford's tender was accepted, and the contract in question entered into between Messrs. Bemrose and Messrs. Ford. The contract followed and incorporated and formed one document with a copy of the conditions of contract upon which Messrs. Ford tendered. The material clauses of the contract provided that the work was to be executed in strict accordance with the requirements of the specifications and drawings to the satisfaction of Messrs. Bemrose or their architect. That "the drawings and specifications are to be considered as equally binding on the contractors who undertake the execution of the work, and if any part is omitted from the drawings and specifications which is usually noted or given or described in them, and which may be reasonably inferred from them as being necessary to properly carry out and complete the works, the same shall be equally binding on the contractors as if it had been specially shown or described. Any alteration of the works contracted for which may be decided upon during their progress must be carried out at prices on which the contract is based, and the value of the alteration or deviation from the original plans, after being so calculated by the contractors and the architect, shall be added to or deducted from the amount of the contract as the case may be, but in no case will any alteration or deviation from the original plans and specifications be allowed to invalidate the contract." The contract provided that all disputes should be referred to arbitration under the Arbitration Act, 1889, and contained a covenant from Messrs. Ford that they would "do and perform the whole of the works required in accordance with the plans and specifications for the erection of the new works, and provide all labour, plant, and materials, &c., of whatsoever kind required, at and for the sum of 10,559*l*." Messrs. Ford completed the work included in the contract, and on April 1, 1897, Mr. Ridgeway, by his final certificate, certified that there was a balance owing to Messrs. Ford of 1,530*l*. 13*s*. 5*d*.; but the latter being dissatisfied with it, and other disputes having arisen under the contract, recourse was had to the arbitration clause in the contract. It was alleged before the arbitrator, and the arbitrator found as a fact, that the quantities set forth and stated in the bill of quantities upon which tenders were invited were in material and substantial respects insufficient, and that the actual quantities of the works required to be executed in carrying out the works in accordance with the plans exceeded those in the bill of quantities. It was also alleged before the arbitrator, and found by him to be the fact, that it was a general usage in the building trade that where tenders are invited for the execution of works in accordance with plans, and a bill of quantities is furnished, a person making a tender is not expected to verify the quantities himself, but is expected to assume that the quantities are correct, and to tender upon that assumption; that if such quantities proved to be greater or less than the actual quantities, the price was to be reduced or increased by an amount ascertained and determined by the scale of prices given in the tender as the scale by which payment for extras were to be determined. The arbitrator also found as a fact that Messrs. Ford did not verify the quantities, and tendered and entered into the agreement on the assumption that the quantities were correct. He also found that various alterations of the works contracted for were decided upon during the progress of the works, and that the sum of 3,281*l*. was to be added to the contract price in respect of such alterations and deviations; that the total value of the work executed, at the prices upon which the contract was based, was 13,840*l*.; and that 8,750*l*. had been paid to Messrs. Ford by Messrs. Bemrose.

The questions left to the Court by the arbitrator to determine were—

1. Whether in ascertaining the amount to be paid by Messrs. Bemrose to Messrs. Ford regard was to be had to the aforesaid usage in the building trade.

2. Whether Messrs. Ford were entitled only to be paid the sum of 10,559*l*. mentioned in the contract, with such deductions and additions as were by the contract provided to be made in respect of alterations or deviations from the original plans determined upon during the progress of the work, or

3. Whether Messrs. Ford were entitled to be paid the value of all the works actually executed by them at the prices upon which the contract was based

and whether such value should be more or less than the sum of 10,559*l.* mentioned in the contract.

The arbitrator certified that if the court answered question 1 in the affirmative, 5,090*l.* remained due to Messrs. Ford; question 2 in the affirmative, 2,303*l.* 10*s.* was due to Messrs. Ford; and question 3 in the affirmative, 5,090*l.* was payable by Messrs. Bemrose to Messrs. Ford.

The Divisional Court answered the questions in favour of the builders (the respondents), holding that the builders had a right to say that they had contracted upon the basis of the accuracy of the representations contained in the quantities forming part of the specifications. The Court held that there had been a breach of that which the builders were entitled to treat as a representation or warranty forming part of the contract, and to the extent to which the warranty was not fulfilled and the builders were damaged, they were entitled to receive compensation. Judgment was accordingly entered for Messrs. Ford & Co., the builders, for 5,090*l.*

The learned counsel said their lordships would see that Messrs. Ford & Co. contracted to do the work described in the plans and specifications for the sum of 10,559*l.*, and there was a proviso that if further work was done above that amount, or work was to be deducted from the contract, then that further work should be estimated for for the purpose of addition or subtraction at the prices which were specified in the bill of quantities. This schedule of prices was not for the purpose of enabling the contract to be made, but was for the purpose of determining the amount to be paid and allowed in respect of any alteration or deviation from the original plans and which might be determined upon during the progress of the work. He submitted that if a builder agreed to do work for a lump sum of 10,559*l.* and got a list of prices, the object of the list being to apply the prices to extras, or to deductions during the work in progress, the contract sum was to be paid subject to increase or reduction by applying those prices to the extras ordered.

Lord Justice Mathew: You say the meaning of that contract is to execute according to the plans without reference to the bill of quantities?

Sir Edward Clarke: Yes, that is my proposition. At least, I do not say "without reference to the bill of quantities." I say that the bill of quantities forms no part of the original contract.

Lord Justice Mathew: You say it is only supplied for the purpose of providing for extras?

Sir Edward Clarke agreed.

Lord Justice Mathew: A tender cannot be made unless the builder knows what he has to do. The architect in some cases takes out the quantities himself, but usually a quantity surveyor or clerk is employed, and he is paid by the building owner.

Sir Edward Clarke: I beg your lordship's pardon.

Lord Justice Mathew: Yes he is. His charges are added in the first certificate given by the architect against the building owner.

Sir Edward Clarke: No. It is included in the amount of the tender, and when the certificate is given, the builder has to pay for the quantities.

Lord Justice Mathew: He gets it from the building owner.

Sir Edward Clarke: No, only as part of his price. He does not get it from the building owner in any sense.

Lord Justice Mathew: The building owner pays for getting the quantities out. I have hitherto understood that a bill of quantities is absolutely indispensable to enable a tender to be obtained

Sir Edward Clarke: There is no doubt that it is necessary the builder should have a bill of quantities in order that he may know what he is expected to do.

Lord Justice Mathew: What he is expected to do! Do you really suggest that any builder would be insane enough to tender upon a plan?

Sir Edward Clarke: The builder, before he tenders, has the bill of quantities. That is for the builder's information in order that he may know what to charge. The builders having the bill of quantities tender for 10,559*l.* Now it was suggested that if it turned out that the quantities were incorrect as against the builders, the builders may charge for the actual work done.

Lord Justice Mathew: You argue that the bill of quantities is to be rejected altogether? You say it is only wanted for the purpose of information as to the extras?

Sir Edward Clarke replied that a distinction must be drawn between the bill of quantities and the prices to be applied to the extra work. He submitted that the Divisional Court had come to a wrong conclusion on the law, and that judgment should have been entered for Messrs. Bemrose.

Mr. Lyttelton, following on the same side, said that the only course open to the builders was to sue upon an express warranty. The misrepresentation in the quantities was admittedly an innocent misrepresentation, and as such formed no cause of action for damages. It had never been pretended by the other side that any new contract had been made in consequence of the misrepresentation. The special case definitely found that there was no special request made by Messrs. Bemrose to the builders to do this work, and they had all along sued upon an express contract, which, of course, negatived an implied contract arising out of the request. Therefore it came to this, that the builders must sue, if at all, upon the representation which they said formed part of the contract, namely, that certain quantities were sufficient to do the work. No injustice would be done to Messrs. Ford & Co. by the construction Messrs. Bemrose sought to put upon the contract.

Lord Justice Mathew: It seems to me that your argument is that the building owner says to the builders, "Plans and specification shall be furnished to you, and I am also aware that bills of quantities will be prepared. All I can contract with reference to them is that my surveyor shall honestly prepare them. I do not make myself responsible for what he does." If any contract is to be arrived at with reference to the quantities it would seem to be a contract of that sort. The building owner did not pledge himself for what was going to be done. He contracts for the plans and specifications, and then you might fairly say the general course of business does not go beyond holding out that the gentleman employed as quantity surveyor will behave honestly in the matter.

Mr. Lyttelton said that it was the duty of the builder to see as to the accuracy of the quantities supplied by the architect. It was absolutely true that the course of business would scarcely permit each builder who was going to tender to bear the cost of preparing the bills of quantities himself, and therefore the custom was that the architect prepared for the builder the bill of quantities. That was a custom which had arisen for the convenience not of the building owner, but of the builder. If the quantity surveyor or architect was fraudulent or negligent, the builder would have a remedy against him.

Lord Justice Romer: I doubt that. I do not think that there is any contract between the builder and the quantity surveyor.

Mr. Lyttelton submitted that the builder would have a remedy in a case of fraud.

Lord Justice Romer: Well, in the case of fraud he might have, but he would have no remedy in a case of negligence.

Mr. Lyttelton thought the builder might have a cause of action against the surveyor if he were guilty of gross negligence, which amounted in equity in some cases to fraud. In the present case no injustice would have resulted to the builders if they had been vigilant, because if they had found out that the quantities were insufficient and the building owners had attempted to enforce it, the builders could easily have defended themselves by having it rescinded on the ground of mutual mistake. If Messrs. Ford had, on finding that the quantities were incorrect, come to Messrs. Bemrose and said they had entered into the contract by mistake, they would have got redress and been put to no loss. But what they did was to attempt to impose on Messrs. Bemrose a contract other than that which they had made, binding Messrs. Bemrose to go on with the work, and then to charge them one-third more than the lump sum they had agreed to pay. In many cases that might be most oppressive, and, indeed, in some cases almost ruinous. The learned counsel did not think that he exaggerated when he asserted that to put such a construction on the contract as the builders sought to put was nothing less than a deliberate and solemn farce.

Mr. English Harrison, on behalf of the respondents, contended that the specification and bill of quantities formed really one document, and that formed the contract. There was an implied warranty that the bill of quantities was correct. It was really an abbreviated specification, because the architect had power to extend the works so far as he thought necessary. The contract was quite an unique production, and, therefore, none of the cases relied upon by his learned friends applied to it.

The Master of the Rolls remarked that the learned counsel's argument seemed to be that the arbitrator could saddle the building owners with the obligation of paying one-third more than the contract price on the ground that the quantities only showed two-thirds of the amount of work required.

Mr. English Harrison submitted that all the documents must be read together, and then there was a warranty or stipulation by the building owners that the quantities were in fact correct. The plans were insufficient to enable the builders to check the bills of quantities.

Lord Justice Mathew: There is no evidence of that.

Lord Justice Romer: You should have got the plans and seen that the quantities were accurate.

Mr. English Harrison said that that point was thoroughly gone into before the arbitrator, and, as the arbitrator had decided the case in the favour of the builders, he might be taken to have found that it was impossible for the builders to check the quantities from the plans before them. He submitted that there was obviously an implied warranty by the building owners that the quantities should not be exceeded. The learned Judges in the Court below thought that must be the result, otherwise there would be the greatest hardship on the builders.

Lord Justice Mathew remarked that there might be a hardship on the building owners as well.

Mr. English Harrison said that the building owners had made a very curious contract in this case, and had given the architect powers which he did not think any other architect had ever had. The contract gave the architect power to extend the works if he at any time thought it necessary. The parties who had been hardly treated in this matter were the builders, because Messrs. Bemrose had got possession of 5,000*l.* worth of their work and materials and did not wish to pay for it.

In the result, the Master of the Rolls, in giving judgment, after stating the facts, said that the point in question did not arise for the first time. It seemed to him that it was the well-ascertained practice for the building owner, who was placing before the builder the materials upon which the work was to be done, to give him the plans and specification, and he generally gave him also the quantities. But it was well understood, and it had been settled in more than one case, that this document—the bill of quantities—whether it was embraced in and made part of one of the other documents—whether in the specification or by a schedule to the contract—or was a separate document altogether, it was not, and was not intended to be, a representation to be acted upon in the sense that it was to be deemed to be a warranty. The most that could be said of it was that it was an estimate which a reasonable person, such as a builder, would probably act upon as being an honest representation made by a skilled person; but beyond that it did not go. In the present case it was made a term of the contract that the person whose tender was accepted must deposit with the architect within fourteen days a priced bill of quantities. So that the builders accepted the obligation of furnishing the bill of quantities. It might be easier for them to put the prices on the quantities sent to them, than it might be to adopt the quantities so sent. But it was part of their obligation to furnish a bill of quantities, and they were not relieved from that obligation because they chose to accept the quantities sent to them by the building owners. That was what occurred in the present case. That being the common sense and business aspect of the case, it could not be pushed beyond that. You could not turn an estimate made for the convenience of all parties into a contract. His lordship thought that the mistake as to the quantities—there being no warranty, and there having been no representation which was not perfectly *bona fide* and honest—was not proper subject matter for a claim for work done thereunder. The work which the builders had done was work done under a contract, and having done it under the contract, and under nothing else, they could not claim under another contract which in point of fact was never made. He thought that the crucial point in the case was that it was a contract for a lump sum. It seemed to him that his learned brothers in the court below were wrong in the view they took of this contract. They seemed to have been imbued with the view that there was an apparent hardship on the contractors who had found themselves bound to spend more money than they had calculated upon by reason of the mistake in the bill of quantities. The answer to that was that it was perfectly competent for the contractors to make their own estimate. He thought that the appeal should be allowed, and the decision of the Divisional Court reversed.

The Lords Justices concurred.

The Master of the Rolls said that the order of the court would be that Messrs. Ford & Co. were entitled only to be paid the sum of 10,559*l.* mentioned in the contract, with such deductions and additions as were by the contract provided to be made in respect of alterations or deviations from the original plans determined upon during the progress of the work. Judgment would accordingly be entered for Messrs. Ford & Co. for 2,303*l.* 10*s.* Messrs. Bemrose were awarded the costs of the appeal and in the court below, and also of the special case which had been stated.

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## WORKMEN'S COMPENSATION ACT:

### "ON, IN, OR ABOUT" THE PREMISES.

AT Brompton County-Court on Tuesday, before Judge Stonor, Joshua Milton, a builder's carman, St. Martin's-cottages, St. James'-street, Hammersmith, W., sought to recover compensation under the Workmen's Compensation Act from Messrs. Wiggins & Co., builders' material merchants, &c., Chancellor's Wharf, Queen-street, Hammersmith. The claim had reference to an accident sustained by the applicant whilst in the respondents' employment.

The applicant was not professionally represented, and Mr. R. M. Minton-Senhouse, counsel, appeared for the respondents.

Applicant's case, briefly, was as follows: On September 26 last he was sent by the respondents with a cartload of plaster to the Veronese Works, Putney Bridge, a distance of about two miles. It appeared that while applicant was backing the horse through a gateway the horse swung round, and crushed the man's left elbow against a post close by. Besides a compound fracture of the arm, the applicant sustained shock to the system. Total incapacity was the result, the duration of which was not ascertainable. His average earnings had been 30*s.* a week, and the present claim was for 15*s.* a week so long as the incapacity continued.

Mr. Minton-Senhouse said that he admitted the facts as above, but he submitted that this was a case to which the Act did not apply. The Act

applied only to accidents "on, in, or about" the premises. Mr. Minton-Senhouse drew his Honour's attention to the case of Penn *v.* Miller, in which a carter met with an accident 110 yards away from the place of employment, and it was held that to this case the Workmen's Compensation Act did not apply. In the present case the accident, so far from being "on, in, or about" the premises, was about two miles away.

The Judge: I think that is quite clear. If the accident occurred as stated in the particulars, it is quite clear that it was not "on, in, or about" the building, factory, or business premises. The application must fail.

## RECENT PATENTS:

### ABSTRACTS OF PATENTED INVENTIONS.

20,320.—A TENON-JOINT: *A. Pfeil.*—The tenon and mortise are both tapered in two directions; one part of the latter is wider than the other, and it is also undercut at its sides; for a table the tenon is made upon a frame-bar, fastened to the top, of which an inclined bar engages with a similar bar mounted on the legs; the specification describes various methods of fastening the parts of chairs, tables, &c., together.

20,323.—AN APPARATUS FOR USE WITH BATHS: *J. Nuttall and R. Wilson.*—A bath may be lifted and lowered within a well in the floor by means of a shaft which is driven at the bottom of the well with bevel gearing from a vertical shaft; cross-shafts and bevel gearing enable the former shaft to drive four vertical screws that engage with nuts affixed to the bath; telescopical fittings join the waste and supply pipes to fixed points, respectively, of the service.

20,324.—MEANS OF LIFTING AND LOWERING MAPS, BLINDS, &C.: *A. W. Read.*—A casing is screwed to the wall or framing, and a cord is wound upon a drum with flanges bearing in the back and cover of the casing. A recess in a ratchet-wheel takes the octagonal collar of one of the flanges, and in that flange are holes through which the cord is passed. A removable handle serves for winding the cord, whereof that portion which is on the right-hand side of the flange is gripped by recesses cut in the flange and in the wheel.

20,340. — IMPROVEMENTS IN BRUSHES: *S. H. Crocker.*—In order that a brush shall serve for roughly polishing wood, metals, and so on, the inventor coats the bristles with some abrasive material such as emery, which is glued or otherwise fixed upon the brush.

20,355. — PLATFORMS FOR SCAFFOLDING: *G. Curley.*—Braced end frames for a movable platform slide between uprights, being raised or lowered by tackle hanging from cross bolts at the upper ends of the uprights. Metallic hangers from the frames support a lower platform, and its shoes and struts press against the uprights, in which are tongues for grooves cut in the frame, to which vertical guide-bars are also fitted. A bracket for carrying a corner or end platform has a projecting bar that will engage with a socket in the frame. The scaffold is described as being available for use by bricklayers, brickmakers, and masons, and in lifting and lowering their materials.

20,378. — LIFTING-TACKLE: *G. Atcrly.* — The pulley-block is adapted for use with mechanism driven by hand or by an electrical motor; a carriage which sustains the pulley-block and motor is mounted on wheels on rails and receives the current through wires; on the motor-shaft is a pinion in gear with an internal spur-wheel running freely upon a shaft that has a worm in gear with the lifting chain-wheel; on the spur-wheel is a pulley which is geared with a band to a pulley running loosely on the shaft of one of the wheels that carry the carriage; the spur-wheel may be turned with a chain and pulley, and either the last-named pulley or the spur-wheel is joined to its shaft with a clutch or is worked with a lever; if the pulley-block is made in one piece with the carriage the spur-wheel is joined by toothed gearing with one, or both, of the carriage-wheels.

20,449. — CONSTRUCTION OF STRONGROOMS AND SAFES: *H. D. Hibbard.*—Manganese steel or some unmachinable metal is used for the casting of the parts whereof the surfaces are then ground. The joints between the parts are not made at their edges or corners. The parts of a safe are fashioned with projections and grooves forming ways for keys, and, after the keys have been inserted, the projections are bound to one another with rings that are shrunk on to them. For a corner joint a round ring and a T-key secure the three projections.

20,453. — CONCRETE FLOORS, CEILINGS, AND BEAMS: *G. A. Wayss.*—For strengthening purposes the inventor uses hoop-iron or other bars and strips, which he joins together with pins, bolts, hooked ends, &c. In one adaptation a floor may be constructed of bundles of hoop-iron strips embedded in concrete about the beams, or of braced concrete beams arranged side by side. For vaulted floors, arched ceilings, curved beams, cornice brackets, and consoles the strips are curved to the shape desired.

20,459.—LAVATORY, BATH, SINK, AND SIMILAR FITTINGS: *R. G. Hourson.*—A tubular lift-valve is set within a cylindrical space of the basin, having ports from its lower end, and seated above the waste-pipe, by which means an overflow will be conveyed through an opening in the basin and thence through openings at the top of the valve. Apertures in the capping admit air when the valve is upon its seating, but when the valve is lifted the apertures will be closed with a stem, and siphonical discharge for cleansing purposes ensues over the top of the valve, together with a discharge through the lower openings of the latter. In another form a separated air escape is provided for the capping, the valve being in that case after the rotatable kind: confer also No. 19,775 of 1898.

20,460.—ATTACHMENTS FOR HANDLES, KNOBS, &c.: *H. C. Pruce.*—A three-way passage is fashioned in the neck of the knob, having a hole in line with a series of holes that are drilled in the spindle and a pair of diverging holes that register with the holes in the spindle. When the knob has been put in its place a split peg or pin is driven through some of the holes and its ends through the rest; the pin may be solid, in which case the neck of the knob will have one oblique hole only.

20,528.—A SUBSTITUTE FOR GLUE: *W. Hackel, A. Heinrich, and C. Gumpricht.*—For a liquid adhesive paste an admixture is made of water-glass and borax upon a water-bath, to which are added talc, natron, boracic acid, whitening, dextrin, and a siccative agent.

20,556.—A WATER HEATER: *S. Ewart and W. H. Bennett.*—Below the boiler, which has a draw-off tap and a domed bottom, is set an annular chamber into which open a set of radiating and tapered water pockets that are disposed within a middle heating-space. In a variant form the water pockets are hung from a flat boiler-bottom.

20,560.—A VACUUM SYSTEM OF HOUSE DRAINAGE: *R. J. Sayers and A. C. Smith.*—For maintaining a partial vacuum in the pipes on the house side of the soil-pipe trap, the inventor supplies a bell pump, which is driven with a water-motor, and will draw air from one side of the trap whilst it forces air through a pipe into a drain on the other side of the trap. The vacuum is regulated by means of a standpipe, which is covered with a bell hung from a lever, and working upon a water-sealed trough. The bell will ascend in the event of a rise of pressure in the system, whereupon the lever will strike the lever of a valve, and so start the motor to exhaust the excess of air. The soil-pipe carries a non-return air-inlet valve, and the inventors contrive that the motor shall be put into action whenever water is drawn away, by causing the water for the house-taps to flow through the motor.

20,569.—A FASTENING FOR WINDOW-SASHES: *M. McConnell.*—When the arm, set for engagement with a curved catch, is moved so as to fasten the window, it will press down a spring-mounted block, which will then be lifted behind it, and so secure the arm. A pressing down of a button will liberate the arm. The spring may be set parallelwise with the sash and at a right angle with the holder of the button.

20,572. — PROCESS OF DRYING BLOCKS AND BRICKS OF CEMENT: *P. O. von Kroltnaurer.*—After their removal from the press the goods are laid edgewise in the upper space of an annular kiln, supplied with hot gases from a regenerative furnace, which are ultimately drawn away with a fan through a round grating and a chamber; hot air is admitted into the top of the kiln through pipes, open to the air without, which are arranged within a middle pipe through which the hot gases ascend, and the furnace gases are admitted at the beginning of the drying process through a cover on a middle portion of the middle pipe, through which may also be conducted hot air and waste furnace gases. The bricks, as they become dried, give their heat to cold air which flows between the columns that support the casing; fireproof linings of mortar protect the pipes from the heat and flames.

20,623.—HOOKS FOR HOISTING APPARATUS: *E. G. Weddell, J. G. Chamberlain, and R. Player.*—By way of an improvement of No. 23,176 of 1899 in respect of a self-detaching hook for use with shaft cages, the inventors supplement the shear blades that engage with the catch-plate, with a lower pair of catches, so as to lessen the distance through which the hook will fall after its detachment is effected.

20,636.—A REGULATING VALVE FOR DOMESTIC WATER SUPPLY: *D. T. Kenney.*—A casing into which the water-service flows has an outlet that, under normal conditions, is closed with a cylindrical valve, in the crown of which is fitted a relieving valve. The flush passes through apertures near the base of the cylinder in which the valve acts. There is a time-passage above. The relieving valve and the working-stem are connected to a weight inside the cylindrical valve. Two pierced washers upon the stem will be lifted in turn by means of shoulders whenever one lifts the valve for flushing purposes. The liberation of the flushing-lever enables the falling weight to firstly shut the relieving valve, the consequent descent of the washers diminishes the volume of the flush before that valve is ultimately closed.

20,639.—MANUFACTURE OF ARTIFICIAL STONE: *W. Dunkelberg.* — For making blocks free from cracks by means of plungers that are moved up and down, two arm-levers linked to bell-crank levers connect the two plungers, and rollers are mounted upon adjustable extensions of the latter levers for engagement with cams of an especial shape, which are bolted to the faces of a pair of toothed wheels. A simultaneous or varying action of the plungers follows in accordance with the relative positions of the cams, and an adjustment of the extension pieces will cause the plungers to make either one stroke or two strokes as the shaft turns once; by that means pressure can be exerted upon the material from both above and below it with single and double blows at different times.

20,652.—CONSTRUCTION OF SCAFFOLDING: *H. A. Röder.*—Tubes, which constitute the uprights, and are pinned or bolted to one another, are joined together with diagonal and horizontal braces which are clamped about the uprights. Split sockets, fitted with clamping rings and screws, hold the lower ends of the tubes, the sockets being adjusted upon the ground with levelling screws through holes in the base plates. Bars are bolted to the bracing clamps for providing brackets to carry safety boards, platforms, and lifting tackle. To one of the clamps is secured a roof ladder. A temporary roof can be held up by the higher inclined stays. In an adaptation, the construction consists of one row of uprights which are secured to the walls with horizontal bars. The invention is described as being available for use upon sloping ground, and in the interior of a building.

20,674.—ARRANGEMENTS FOR PUBLIC WASH-HOUSES: *D. K. Tullis.*—As a means of drying clothes, and securing ventilation, the inventor furnishes each washing-stall with a corrugated tub and a boiler or copper, of which the conical top has a hinged door; escape of steam from the coppers into the wash-house is prevented by a system of pipes which lead from the domes of the coppers to cross-pipes joined to a main exhaust pipe through which hot or cold air may be conducted; the clothes-horses, carried by rails or wheels, automatically work plates or sliding valves whereby a supply of hot air through distributing-boxes is regulated; an exhaust-pipe draws away moist air, and each clothes-horse, being closed on three sides, constitutes a drying-chamber.

20,732.—STAIRS AND STAIRCASES: *A. R. Robinson.*—Stone, cement mixed with coke-breeze, or other concrete, is employed for building up the staircase, recesses are formed in the steps for taking dovetailed or other battens and detachable treads of which the sections are screwed on to the battens. Dovetailed openings may be made in the sides of the staircases through which the battens can be passed.

20,705.—A COMBINED FASTENER AND ALARM: *J. G. Moser.*—A fastener for window-sashes, doors, and so on, comprises two plates which are pivotted on to a screw and together form a casing. As one attempts to open the sash or door, the turning of the fastener upon its pivot will be prevented by a shoulder, so as to force up a trigger and thereby explode a cartridge. A spring retains the hammer, which is fashioned in one piece with the trigger, in its place as set, but when the hammer is turned through a small angle the spring forces it down on to the cartridge.

## MEETINGS.

### FRIDAY, MARCH 21.

*Architectural Association.*—Mr. W. H. Lever on "The Dwellings erected at Port Sunlight and Thornton Hough," 7.30 p.m.

*Royal Institution.*—Geheimrath Professor Otto N. Witt on "Recent Developments in Colouring Matter," 9 p.m.

*Sanitary Institute (Lectures for Sanitary Officers).*—Mr. W. Spinks on "House Drainage," 7 p.m.

*Institution of Mechanical Engineers.*—Papers to be read, and discussed collectively:—"Fencing of Steam and Gas Engines," by Mr. Henry D. Marshall; "Fencing or Guarding Machinery used in Textile Factories," by Mr. Samuel R. Platt; "Protection of Lift-shafts, and Safety Devices in connection with Lift-doors and Controlling Gear," by Mr. Henry C. Walker; "Guarding Machine Tools," by Mr. W. H. Johnson, 8 p.m.

*Birmingham Architectural Association.*—Mr. G. A. Cox on "The B.A.A. Excursion to Burford," illustrated by Mr. J. Ward.

*Glasgow Architectural Craftsmen's Society.*—Messrs. J. McLeod and A. W. R. Bell on "Prevention of Damp in Walls," 8 p.m.

### SATURDAY, MARCH 22.

*Architectural Association.*—Fourth spring visit, to (1) the Roman Catholic Cathedral, Ashley-gardens, Victoria-street, Westminster, 2.30 p.m.; (2) New Police-station at Cannon-row (New Scotland Yard), 4 p.m.

*Sanitary Institute (Demonstration for Sanitary Officers).* — Inspection at Beddington Sewage Farm, 3 p.m.

*Edinburgh Architectural Association.*—Visit to Glasgow under the auspices of the Glasgow Architectural Association.

*Royal Institution.* — Rt. Hon. Lord Rayleigh on "Some Electrical Developments." VI. 3 p.m.

*Dundee Institute of Architecture.*—Visit to Leuchars Church and Earlshall.

*Hartley College Engineering Society (Southampton).*—Mr. D. R. Bennett on "The Construction of Roads and Streets," 7 p.m.

*Builders' Foremen's Association.*—Monthly meeting, Memorial Hall, Farringdon-street.—7.30 p.m.

### MONDAY, MARCH 24.

*Surveyors' Institution.*—Adjourned discussion on Mr. C. H. Bedells' paper on "The Insurance of Buildings against Fire," 8 p.m.

*Sanitary Institute (Lectures for Sanitary Officers).*—Mr. J. E. Worth on "Water Supply, Sources of Supply and Distribution," 7 p.m.

*Liverpool Architectural Society (Incorporated).*—Mr. W. H. Lever on "Port Sunlight." 6 p.m.

TUESDAY, MARCH 25.

*Institution of Civil Engineers.*—Papers to be submitted for discussion:—(1) "The Greenwich Footway Tunnel," by Mr. W. C. Copperthwaite; (2) "Subaqueous Tunnelling Through the Thames Gravel: Baker-street and Waterloo Railway," by Mr. Arthur H. Haigh. 8 p.m.

WEDNESDAY, MARCH 26.

*Builders' Foremen and Clerks of Works' Institution.*—Quarterly Meeting of the Directors. 8 p.m.

*Sanitary Institute (Demonstrations for Sanitary Officers).*—Inspection of the East London Water Works, Lee Bridge, Clapton. 3 p.m.

*Devon and Exeter Architectural Society (Plymouth Devonport, and Stonehouse Branch).*—Mr. A. S. Parker on "Building By-Laws."

*Edinburgh Architectural Association.*—Mr. D. Beveridge on "Sir John Vanbrugh and his Work," illustrated by lime-light views. 8 p.m.

THURSDAY, MARCH 27.

*Leeds and Yorkshire Architectural Society.*—(1) Mr. J. Starkie Gardner on "Decorative Wrought Ironwork." (2) Election of Officers. 6.30 p.m.

## SOME RECENT SALES OF PROPERTY:

### ESTATE EXCHANGE REPORT.

March 5.—By E. BALLARD (on the Premises).

Dartmouth, Devon.—The Quay, the Castle Hotel, f., p., subject to a rent charge of 35*l.* per annum ..... £4,000

By FRED. W. STOTT (at Rochdale).

Castleton, Lancs.—Dicker Green, Slacks and Moorside Estates, 61 a. 0 r. 1 p., f., p. ..... 2,960

March 6.—By T. MARTIN & SON (at Exeter).

Exeter.—Spicer-rd., Maryland, and a plot of building land adjoining, area 25,300 ft., f., p. 2,500

By E. BUPTON & SON (at Llandrindod Wells).

Llandrindod Wells, Radnor.—The Gorse Farm, 98 a., f., p. ..... 4,050

March 7.—By POWELL & POWELL (at Yeovil).

North Cadbury, Somerset.—Woolston House (Hunting Box) and 2 a. 3 r. 32 p., f., y.r. 47*l.* 1,000

A freehold dairy farm, 45 a. 2 r. 30 p. ..... 2,750

March 8.—By WM. PARLOUR (at Well).

Well, Yorks.—House, blacksmith's shop, and 0 a. 1 r. 22 p., f. ..... 240

House and three fields, 5 a. 2 r. 23 p., f. ..... 525

March 10.—By FRANCIS DOD & CO.

Hackney.—98 and 100, Norfolk-rd., u.t. 59½ yrs., g.r. 8*l.*, e.r. 90*l.* ..... 825

Victoria Park.—3, Dagmar-ter., u.t. 43 yrs., g.r. 4*l.* 10s., y.r. 36*l.* 8s. ..... 240

Bow.—38, British-st., f., w.r. 36*l.* 8s. ..... 460

By HAYDEN & WHEELER.

Crouch End.—Haringay-pk., Holmwood, u.t. 96 yrs., g.r. 8*l.* 10s., y.r. 46*l.* ..... 500

By W. H. HILTON.

Clapton.—126, 130, and 132, Blurton-rd., u.t. 71 yrs., g.r. 12*l.*, w.r. 93*l.* 12s. ..... 780

Hackney.—218, Richmond-rd., u.t. 43 yrs., g.r. 6*l.* 10s., y.r. 40*l.* ..... 515

34, 35, 43, 44, 45, and 46, Warburton-rd., u.t. 44 yrs., g.r. 17*l.* 7s., w.r. 152*l.* 2s. ..... 775

Victoria Park.—79, North-st., u.t. 52 yrs., g.r. 5*l.* 10s., y.r. 30*l.* ..... 310

By J. & W. JOHNSON & CO.

Hackney.—65, 67, 71 to 83 (odd), Weymouth-ter.; also i.g.r. 24*l.* 10s., u.t. 12 yrs., g.r. 36*l.*, w.r. 274*l.* 14s. ..... 830

By Messrs. KEMSLEY.

Stratford.—34, The Green, f., y.r. 36*l.* ..... 350

Leytonstone.—369 and 371, Leytonstone-rd., u.t. 80 yrs., g.r. 10*l.*, w.r. 72*l.* 16s. ..... 580

By ROBINS & LINE.

Abbot's Langley, Herts.—The Causeway House and 1¾ a., f., p. ..... 1,225

March 10.—By FRED. VARLEY.

Finsbury Park.—78, Finsbury Pk.-rd., u.t. 65 yrs., g.r. 9*l.* 9s., e.r. 30*l.* ..... 510

59, Gloucester-rd., u.t. 57 yrs., g.r. 12*l.* 12s., e.r. 70*l.* ..... 600

March 11.—By F. E. FERDINANDO & CO.

Old Kent-road.—83, Marlborough-rd., f., e.r. 39*l.* 370

Walworth.—94, Beresford-st, u.t. 69 yrs., g.r. 5*l.* 10s., w.r. 42*l.* 5s. ..... 290

By HUNTER & HUNTER.

Shepherd's Bush.—35, 37, 39, 53, 55, and 57, Westville-rd., u.t. 77 yrs., g.r. 36*l.*, y.r. 108*l.* ..... 1,220

By MAPLE & CO.

Hyde Park.—20, Lancaster-mews (stabling), f., e.r. 30*l.* ..... 650

Hampstead-rd.—75, Oakley-sq., u.t. 41 yrs., g.r. 11*l.*, e.r. 75*l.* ..... 560

Hornsey.—1, Willoughby-rd., u.t. 85 yrs., g.r. 10*l.*, e.r. 65*l.* ..... 650

By ROGERS, CHAPMAN, & THOMAS.

Chelsea.—39, Sloane-gdns., u.t. 83½ yrs., g.r. &c. 10*l.* 5s., p. ..... 5,625

South Kensington.—21, Bolton-gdns., u.t. 70 yrs., g.r. 34*l.* 4s., p. ..... 3,225

March 12.—By BOYCE, EVENS, & CARPENTER.

Limehouse.—9, Blount-st., c., q.r. 19*l.* 19s. ..... 275

Hoxton.—42, 44, and 46, Cavendish-st., u.t. 27 yrs., g.r. 15*l.* 15s., w.r. 156*l.* 18s. ..... 905

246 to 254 (even), Hoxton-st., u.t. 16 yrs., g.r. 3½*l.*, y.r. 184*l.* ..... 830

By H. DONALDSON & SON.

Bow.—62, Bloomfield-rd., u.t. 66 yrs., g.r. 4*l.* 10s., y.r. 36*l.* ..... 355

Dalston.—84, Lavender-gr., u.t. 48 yrs., g.r. 5*l.* 5s., y.r. 34*l.* ..... 375

By DRIVERS (Holloway).

Holloway.—13, Bedford-ter., f., q.r. 27*l.* ..... 375

12, Paddington-st., f., w.r. 26*l.* ..... 250

12, Durham-rd., u.t. 50½ yrs., g.r. 4*l.*, y.r. 24*l.* 385

98, Andover-rd., u.t. 70½ yrs., g.r. 6*l.*, y.r. 30*l.* 250

By ELSWORTH & KNIGHTON.

South Kensington.—54, Cromwell-rd., and 98, Queen's Gate-place-mews, u.t. 54 yrs., g.r. 4*l.*, p. ..... 3,775

By G. HERBERT & CO.

Regent-st.—17 and 18, Little Palteney-st., u.t. 13 yrs., g.r. 150*l.*, y.r. 335*l.* 6s. ..... 345

By E. HOLSWORTH.

Stoke Newington.—13, Brodia-rd., u.t. 27 yrs., g.r. 6*l.*, e.r. 32*l.* ..... £365

By JAS. HOOD & SONS.

East Ham.—10, 12, 14, and 16, Bartle-av., u.t. 97½ yrs., g.r. 20*l.*, w.r. 140*l.* 8s. ..... 840

By A. DOWELL (at Edinburgh).

Kelso (near), Roxburgshire.—The estate of Sydenham, 146¾ a., y.r. 337*l.* ..... 10,000

March 13.—By ALDRIDGES.

Stone, Kent.—Main-rd., Hillhouse and 3¼ a., f., p. 1 and 2, Hillhouse-villas, f., w.r. 31*l.* 4s. ..... 1,180

Upper Caterham, Surrey.—Whyteleafe-rd., f.g.r. 20*l.*, reversion in 80 yrs. ..... 340

Whyteleafe-rd., f.g.r. 12*l.* 10s., reversion in 90 yrs. ..... 535

Ashford, Middlesex.—The Broadway, f.g. rents 32*l.*, reversion in 98 yrs. ..... 310

By BISLEY & SONS.

Rotherhithe.—1 to 4, Elizabeth-pl., f., w.r. 62*l.* 8s. ..... 718

1 to 4, Seven Step-alley, f., w.r. 67*l.* 12s. ..... 495

7 and 8, Elephant-lane, f., w.r. 33*l.* 16s. ..... 500

43, St. Marychurch-st., f., w.r. 20*l.* 16s. ..... 260

20 and 22, Renforth-st., f., w.r. 33*l.* 16s. ..... 230

15 and 16, Hadland-st., u.t. 54 yrs., g.r. 4*l.* 10s., w.r. 58*l.* 10s. ..... 320

14 and 16, Ayton-st., u.t. 92 yrs., g.r. 6*l.*, w.r. 44*l.* 4s. ..... 530

1 to 6, Reed-st., u.t. 48½ yrs., g.r. 13*l.* 10s., w.r. 133*l.* 12s. ..... 250

33, St. Marychurch-st., f., w.r. 20*l.* 16s., subject to rent charge of 1*l.* ..... 1,100

Bermondsey.—48, Keeton's-rd., u.t. 44 yrs., g.r. 3*l.* 10s., w.r. 41*l.* 12s. ..... 210

By H. J. BLISS & SONS.

St. Luke's.—114, Goswell-rd. (S.), f., y.r. 55*l.* ..... 350

70 to 77, Bastwick-st., f., w.r. 358*l.* 18s. ..... 1,120

Old Ford.—13, 15, 21, and 23, Monteith-rd., f., w.r. 104*l.* ..... 3,060

Victoria Park.—94, Bonner-rd., u.t. 52 yrs., g.r. 8*l.*, e.r. 45*l.* ..... 1,095

Hackney.—31 and 37, Rutland-rd., u.t. 59½ yrs., g.r. 8*l.*, y.r. 56*l.* ..... 395

By G. BRINSLEY & SON.

Dulwich.—Forest Hill-rd., f.g.r. 48*l.*, reversion in 76 yrs. ..... 660

By J. G. DEAN & CO.

Croydon.—60 to 72 (even), Longfellow-rd., f., w.r. 152*l.* ..... 1,310

By FAREBROTHER, ELLIS, & CO.

Maida Vale.—Lanark Villas, i.g.r. 80*l.*, u.t. 48¾ yrs., g.r. 40*l.* ..... 1,660

St. Leonards-on-Sea, Sussex.—55, Marina, u.t. 80 yrs., g.r. 25*l.*, p. ..... 720

March 13.—By C. C. & T. MOORE.

Hackney.—6, Devonshire-pl., with yard and stabling in rear, f., w.r. 80*l.* 12s. ..... 760

Bromley-by-Bow.—20, 22A, 24, 26, and 28, Furze-street, f., w.r. 150*l.* ..... 710

Poplar.—Broomfield-st., freehold chemical works, area 10,800 ft., y.r. 97*l.* ..... 2,200

Southwark.—1, 2, and 3, Bear-gdns., area 11,500 ft., f., p. ..... 1,875

Battersea.—24 and 24A, Speke-rd., with yard, stabling, and factory in rear, u.t. 51½ yrs., g.r. 7*l.* 4s., y.r. 45*l.* ..... 6,100

Old Ford.—1, 3, 5, and 7, Candy-st., f., w.r. 120*l.* 18s. ..... 400

Poplar.—302 and 304, Manchester-rd., u.t. 39½ yrs., g.r. 12*l.*, y.r. 60*l.* ..... 1,200

Limehouse.—43, Brenton-st., u.t. 42½ yrs., g.r. 6*l.*, w.r. 41*l.* 12s. ..... 300

Wanstead.—48 and 50, Mornington-rd., f., y.r. 60*l.* ..... 200

By STIMSON & SONS.

Camberwell.—22A, Lothian-rd. (S), u.t. 67½ yrs., g.r. 5*l.*, w.r. 36*l.* 8s. ..... 625

24 to 40 (even), and 60, Lothian-rd., u.t. 55¼ to 59¼ yrs., g.r. 41*l.*, w.r. 322*l.* 8s. ..... 215

62, Lothian-rd., and 2 and 4, Tindal-st., u.t. 55¼ yrs., g.r. 12*l.*, w.r. 94*l.* 18s. ..... 2,415

25, Tindal-st., f., y.r. 29*l.* 18s. ..... 630

Tindal-st., f.g.r. 4*l.*, reversion in 58½ yrs. ..... 360

7 and 9, Tindal-st., u.t. 57¼ yrs., g.r. 8*l.*, w.r. 59*l.* 16s. ..... 120

54 and 56, Langton-st., u.t. 59¾ yrs., g.r. 9*l.*, w.r. 76*l.* 14s. ..... 465

38 to 46 (even), Leipsic-rd., u.t. 3 yrs., g.r. 14*l.*, w.r. 144*l.* 13s. ..... 455

99, Farmers-rd., u.t. 48¼ yrs., g.r. 3*l.*, y.r. 40*l.* 125

39, 41, and 43, Mosedale-st., u.t. 54 yrs., g.r. 12*l.* 12s., w.r. 83*l.* 4s. ..... 340

42, 48, 50, and 52, Westmacott-st., u.t. 32 yrs., g.r. 10*l.*, w.r. 78*l.* ..... 695

220, 222, and 224, Southampton-st., also i.g.r. 6*l.* 10s., u.t. 30 yrs., g.r. 18*l.*, w.r. 83*l.* 4s. ..... 410

Peckham.—15 and 17, Blakes-rd., u.t. 6.¾ yrs., g.r. 8*l.* 8s., w.r. 46*l.* 16s. ..... 450

122, Commercial-rd., u.t. 71¼ yrs., g.r. 5*l.*, w.r. 32*l.* 10s. ..... 405

107 to 113 (odd), Gordon-rd., u.t. 65¼ yrs., g.r. 20*l.* w.r. 117*l.* ..... 250

31 and 33, Nunhead-green, u.t. 63 yrs., g.r. 8*l.*, w.r. 56*l.* 12s. ..... 985

Norwood.—39 and 45, Thurlow-hill, f., w.r. 67*l.* 12s. ..... 455

Streatham.—187 and 189, Eardley-road, u.t. 77¾ yrs., g.r. 7*l.*, w.r. 41*l.* 12s. ..... 680

South Lambeth.—77, Trigon-rd., u.t. 23¾ yrs., g.r. 4*l.*, y.r. 32*l.* ..... 335

Barnes.—Railway-st., f.g.r. 6*l.*, reversion in 83 yrs. ..... 250

111 and 113, Railway-st., f., w.r. 41*l.* 12s. ..... 140

Raynes Park.—Kingston-rd., a plot of building land, f., p. ..... 400

Richmond-rd., a plot of building land, f., p. ..... 170

Upton Park.—43 to 49 (odd), Redclyffe-rd., f., w.r. 88*l.* 8s. ..... 120

Selsdon-rd., two corner plots of building land, f., p. ..... 860

Plaistow.—20 and 22, Ann-st., f., w.r. 44*l.* 4s. ..... 155

By VENTOM, BULL, & COOPER.

Hampstead.—23, Lancaster-rd., u.t. 991 yrs., g.r. 25*l.*, p. ..... 470

By WM. WESTON.

Dulwich.—22, Tyrrell-rd., (S.), u.t. 74 yrs., g.r. 7*l.*, y.r. 30*l.* ..... 1,100

Maida Vale.—48, Sutherland-av., u.t. 61 yrs., g.r. 10*l.*, y.r. 75*l.* ..... 300

By HENRY HENDRIES (at Birmingham).

Stetchford, Worcester.—Albert-rd, Sherwood House, u.t. 92 yrs., g.r. 3*l.* 10s., p. ..... 660

Birmingham.—13, Summer-lane, also the White Horse Inn and four cottages in rear, f., w.r. 116*l.* 14s. ..... 450

March 14.—By DAVID J. CHATTELL.

Chislehurst.—Lower Camden, Little Langtons, f., y.r. 80*l.* ..... £1,730

Lower Camden, the Woodlands, f., y.r. 70*l.* ..... 970

Lower Camden, the Cottage, f., y.r. 60*l.* ..... 850

By W. A. BLAKEMORE.

Westminster.—10, 12, and 14, Ponsonby-pl., u.t. 23¾ yrs., g.r. 18*l.*, w.r. 209*l.* 6s. ..... 1,000

Barnes.—Lonsdale-rd., Scipio Villa, u.t. 50 yrs., g.r. 10*l.*, e.r. 50*l.* ..... 950

Bayswater.—16, Northumberland-pl., u.t. 44 yrs., g.r. 6*l.* 10s., y.r. 48*l.* ..... 325

Rotherhithe.—16 and 18, Rotherhithe New-rd., u.t. 46 yrs., g.r. 7*l.* 10s., w.r. 65*l.* ..... 475

By HENRY CHAPMAN & CO.

Shepherd's Bush.—96, St. Stephen's-av., f., y.r. 28*l.* ..... 430

46, St. Stephen's-av., u.t. 51½ yrs., g.r. 10*l.*, e.r. 45*l.* ..... 515

Bethnal Green.—509 and 511, Cambridge-rd. (S.), f., y.r., 80*l.* ..... 330

517, Cambridge-rd. (S.), f., y.r. 40*l.* ..... 1,405

Maidstone, Kent.—46 and 48, King-st., f., y.r. 35*l.* ..... 700

Shepperton, Middlesex.—Green-lane, f.g.r. 7*l.* 10s., reversion in 98 yrs. ..... 540

By SCOBELL & LAKE.

Paddington.—56, Harrow-rd. (S.), u.t. 37 yrs., g.r. 10*l.*, y.r. 65*l.* ..... 190

42, Southwick-st. (S.), and 15, Southwick-mews (slaughter-house, stable, &c.), u.t. 28 and 30 yrs., g.r. 17*l.*, y.r. 100*l.* ..... 600

Notting Hill.—104, Portobello-rd., u.t. 41 yrs., g.r. 6*l.*, y.r. 32*l.* ..... 970

*Contractions used in these lists.*—F.g.r. for freehold ground-rent; gdns. for gardens; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; yd. for yard.

## PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

### BRICKS, &c.

| | £ | s. | d. | | |
|---|---|---|---|---|---|
| Hard Stocks .... | 1 | 11 | 6 | per 1,000 | alongside, in river. |
| Rough Stocks and Grizzles ..... | 1 | 9 | 6 | ,, | ,, ,, |
| Facing Stocks .... | 2 | 12 | 0 | ,, | ,, ,, |
| Shippers ..... | 2 | 5 | 0 | ,, | ,, ,, |
| Flettons ..... | 1 | 8 | 0 | ,, | at railway depôt. |
| Red Wire Cuts .. | 1 | 12 | 0 | ,, | ,, ,, |
| Best Fareham Red | 3 | 12 | 0 | ,, | ,, ,, |
| Best Red Pressed Ruabon Facing | 5 | 5 | 0 | ,, | ,, ,, |
| Best Blue Pressed Staffordshire .. | 4 | 6 | 6 | ,, | ,, ,, |
| Do., Bullnose .... | 4 | 10 | 0 | ,, | ,, ,, |
| Best Stourbridge Fire Bricks .... | 4 | 5 | 6 | ,, | ,, ,, |
| GLAZED BRICKS | | | | | |
| Best White and Ivory Glazed Stretchers..... | 13 | 0 | 0 | ,, | ,, ,, |
| Headers ..... | 12 | 0 | 0 | ,, | ,, ,, |
| Quoins, Bullnose, and Flats ..... | 17 | 0 | 0 | ,, | ,, ,, |
| Double Stretchers | 19 | 0 | 0 | ,, | ,, ,, |
| Double Headers .. | 16 | 0 | 0 | ,, | ,, ,, |
| One Side and two Ends ..... | 19 | 0 | 0 | ,, | ,, ,, |
| Two Sides and one End ..... | 20 | 0 | 0 | ,, | ,, ,, |
| Splays, Chamfered, Squints..... | 20 | 0 | 0 | ,, | ,, ,, |
| Best Dipped Salt Glazed Stretchers and Headers .. | 12 | 0 | 0 | ,, | ,, ,, |
| Quoins, Bullnose, and Flats ..... | 14 | 0 | 0 | ,, | ,, ,, |
| Double Stretchers | 15 | 0 | 0 | ,, | ,, ,, |
| Double Headers.. | 14 | 0 | 0 | ,, | ,, ,, |
| One Side and two Ends ..... | 15 | 0 | 0 | ,, | ,, ,, |
| Two Sides and one End ..... | 15 | 0 | 0 | ,, | ,, ,, |
| Splays, Chamfered, Squints..... | 14 | 0 | 0 | ,, | ,, ,, |
| Seconds Quality White and Dipped Salt Glazed .... | 2 | 0 | 0 | ,, | less than best. |

| | £ | s. | | |
|---|---|---|---|---|
| Thames and Pit Sand ..... | 7 | 3 | per yard, | delivered. |
| Thames Ballast ..... | 6 | 0 | ,, | ,, |
| Best Portland Cement ..... | 32 | 0 | per ton, | delivered. |
| Best Ground Blue Lias Lime.. | 25 | 0 | ,, | ,, |

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s. od. per yard, delivered.

Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. d[epôt].

### STONE.

| | £ | s. | d. | | |
|---|---|---|---|---|---|
| Ancaster in blocks .... | 1 | 11 | | per ft. cube, | deld. rly. depôt. |
| Bath ,, .... | 1 | 7 | | ,, | ,, |
| Farleigh Down Bath .. | 1 | 8 | | ,, | ,, |
| Beer in blocks .... | 1 | 6 | | ,, | ,, |
| Grinshill ,, .... | 1 | 10 | | ,, | ,, |
| Brown Portland in blocks | 2 | 2 | | ,, | ,, |
| Darley Dale in blocks.. | 2 | 4 | | ,, | ,, |
| Red Corsehill ,, | 2 | 5 | | ,, | ,, |
| Closeburn Red Freestone | 2 | 3 | | ,, | ,, |
| Red Mansfield ,, | 2 | 4 | | ,, | ,, |
| Hard York in blocks .. | 2 | 10 | | ,, | ,, |
| Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup) | 2 | 8 | | per ft. super. | at rly. depôt. |

## PRICES CURRENT (*Continued*).

### STONE.

| | | | s. d. | |
|---|---|---|---|---|
| Hard York, | 6 in. | Rubbed Ditto | 3 0 | per ft. super, at rly. depot. |
| ,, ,, | 3 in. | sawn both sides slabs (random sizes) | 1 3 | ,, ,, |
| ,, ,, | 2 in. | self-faced Ditto | 0 9½ | ,, ,, |
| Hopton Wood (Hard Bed) in blocks | | | 2 | 3 per ft. cube. deld. rly. depôt. |
| ,, ,, | 6 in. | sawn both sides landings | 2 | 7 per ft super. deld rly. depôt. |
| ,, ,, ,, | 3 in. | do. | 1 | 2½ ,, ,, |

### SLATES.

| in. | in. | | £ s. d. | |
|---|---|---|---|---|
| 20 × 10 | best blue Bangor | 12 | 0 0 | per 1000 of 1200 at rly d. p. |
| ,, | best seconds ,, | 11 | 10 0 | ,, ,, |
| 16 × 8 | best ,, | 6 | 15 0 | ,, ,, |
| 20 × 10 | best blue Portmadoc | 11 | 5 0 | ,, ,, |
| 16 × 8 | best blue Portmadoc | 6 | 0 0 | ,, ,, |
| 20 × 10 | best Eureka unfading green | 12 | 2 6 | ,, ,, |
| 16 × 8 | ,, ,, | 7 | 5 0 | ,, ,, |
| 20 × 10 | permanent green | 10 | 5 0 | ,, ,, |
| 16 × 8 | ,, ,, | 5 | 17 6 | ,, ,, |

### TILES.

| | s. d. | |
|---|---|---|
| Best plain red roofing tiles | 41 6 | per 1,000, at rly. depôt |
| Hip and valley tiles | 3 7 | per doz. ,, ,, |
| Best Broseley tiles | 48 6 | per 1,000 ,, ,, |
| Hip and valley tiles | 4 0 | per doz. ,, ,, |
| Best Ruabon Red, brown or brindled Do. (Edwards) | 57 6 | per 1,000 ,, ,, |
| Do. ornamental Do. | 60 0 | ,, ,, ,, |
| Hip tiles | 4 0 | per doz. ,, ,, |
| Valley tiles | 3 9 | ,, ,, ,, |
| Best Red or Mottled Staffordshire Do. (Peakes) | 50 9 | per 1,000 ,, ,, |
| Hip tiles | 4 1 | per doz. ,, ,, |
| Valley tiles | 3 8 | ,, ,, ,, |

### WOOD.

BUILDING WOOD.—YELLOW.

| | At per standard. £ s. d. | £ s. d. | |
|---|---|---|---|
| Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in. | 14 10 0 | 16 0 0 | |
| Deals: best 3 by 9 | 13 10 0 | 15 0 0 | |
| Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in. | 10 10 | 11 10 0 | |
| Battens: best 2½ by 6 and 3 by 6 | 0 10 0 | less than 7 in. and 8 in. | |
| Deals: seconds | 1 0 0 | less than best | |
| Battens: seconds | 0 10 0 | ,, ,, ,, | |
| 2 in. by 4 in. and 2 in. by 6 in. | 8 10 0 | 9 10 0 | |
| 2 in. by 4½ in. and 2 in. by 5 in. | 8 0 0 | 9 0 0 | |
| Foreign Sawn Boards— 1 in. by 12 in. by 12 in. | 0 10 0 | more than battens. | |
| ¾ in. | 1 0 0 | ,, | |
| Fir timber: Best middling Danzig or Memel (average specification) | At per load of 50 ft. 4 10 0 | 5 0 0 | |
| Seconds | 4 5 0 | 4 10 0 | |
| Small timber (8 in. to 10 in.) | 3 12 6 | 3 15 0 | |
| Swedish balks | 2 15 0 | 3 0 0 | |
| Pitch-pine timber (30 ft.) | 3 0 0 | 3 10 0 | |

JOINERS' WOOD.

| | At per standard. | | |
|---|---|---|---|
| White Sea: First yellow deals, 3 in. by 11 in. | 22 0 0 | 23 0 0 | |
| 3 in. by 9 in. | 20 0 0 | 21 0 0 | |
| Battens, 2½ in. and 3 in. by 7 in. | 16 10 0 | 18 0 0 | |
| Second yellow deals, 3 in. by 11 in. | 18 0 0 | 20 0 0 | |
| ,, ,, 3 in. by 9 in. | 16 10 0 | 18 10 0 | |
| Battens, 2½ in. and 3 in. by 7 in. | 13 0 0 | 14 0 0 | |
| Third yellow deals, 3 in. by 11 in. and 9 in. | 14 0 0 | 15 10 0 | |
| Battens, 2½ in. and 3 in. by 7 in. | 11 10 0 | 12 10 0 | |
| Petersburg: first yellow deals, 3 in. by 11 in. | 20 0 0 | 21 0 0 | |
| Do. 3 in. by 9 in. | 17 0 0 | 18 0 0 | |
| Battens | 13 0 0 | 14 0 0 | |
| Second yellow deals, 3 in. by 11 in. | 15 0 0 | 16 10 0 | |
| Do. 3 in. by 9 in. | 13 10 0 | 14 10 0 | |
| Battens | 11 0 0 | 12 0 0 | |
| Third yellow deals, 3 in. by 11 in. | 12 10 0 | 13 10 0 | |
| Do. 3 in. by 9 in. | 12 0 0 | 13 0 0 | |
| Battens | 10 0 0 | 11 0 0 | |
| White Sea and Petersburg:— First white deals, 3 in. by 11 in. | 14 0 0 | 15 0 0 | |
| ,, ,, ,, 3 in. by 9 in. | 13 0 0 | 14 0 0 | |
| Battens | 11 0 0 | 12 0 0 | |
| Second white deals 3 in. by 11 in. | 13 0 0 | 14 0 0 | |
| ,, ,, ,, 3 in. by 9 in. | 12 0 0 | 13 0 0 | |
| ,, ,, ,, battens | 9 10 0 | 10 10 0 | |
| Pitch-pine: deals | 16 0 0 | 18 0 0 | |
| Under 2 in. thick extra | 0 10 0 | 1 0 0 | |
| Yellow Pine—First, regular sizes | 32 0 0 | 33 10 0 | |
| Broads (12 in. and up) | 2 0 0 | more. | |
| Oddments | 22 0 0 | 24 0 0 | |
| Seconds, regular sizes | 24 10 0 | 26 10 0 | |
| Yellow Pine Oddments | 20 0 0 | 22 0 0 | |
| Kauri Pine—Planks, per ft. cube | 0 3 6 | 0 4 6 | |
| Danzig and Stettin Oak Logs—Large, per ft. cube | 0 2 6 | 0 3 0 | |
| Small ,, ,, | 0 2 3 | 0 2 6 | |
| Wainscot Oak Logs, per ft. cube | 0 5 0 | 0 5 6 | |
| Dry Wainscot Oak, per ft. sup. as inch | 0 0 7½ | 0 0 8 | |
| ¾ in. do. do. | 0 0 7 | - - - | |
| Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch | 0 0 9 | 0 0 11 | |
| Selected, Figury, per ft. sup. as inch | 0 1 6 | 0 2 0 | |
| Dry Walnut, American, per ft. sup. as inch | 0 0 10 | 0 1 0 | |
| Teak, per load | 16 0 0 | 20 0 0 | |
| American Whitewood Planks— Per ft. cube | 0 3 0 | 0 3 6 | |

Prepared Flooring— Per square.

| | | |
|---|---|---|
| 1 in. by 7 in. yellow, planed and shot | 0 13 0 | 0 16 6 |
| 1 in. by 7 in. yellow, planed and matched | 0 13 6 | 0 17 6 |

## PRICES CURRENT (*Continued*).

### WOOD.

| Prepared Flooring— | Per square. £ s. d. | £ s. d. | |
|---|---|---|---|
| 1¼ in. by 7 in. yellow, planed and matched | 0 15 0 | 1 0 0 | |
| 6 in. at 6d. per square less than 7 in. | | | |
| 1 in. by 7 in. white, planed and shot | 0 11 0 | 0 12 6 | |
| 1 in. by 7 in. white, planed and matched | 0 11 6 | 0 13 6 | |
| 1¼ in. by 7 in. white, planed and matched | 0 13 6 | 0 15 6 | |
| 6 in. at 6d. per square less than 7 in. | | | |

### JOISTS, GIRDERS, &c.

| | In London, or delivered Railway Vans, per ton. £ s. d. | £ s. d. | |
|---|---|---|---|
| Rolled Steel Joists, ordinary sections | 6 2 6 | 7 2 6 | |
| Compound Girders ,, ,, | 7 17 6 | 8 17 6 | |
| Angles, Tees and Channels, ordinary sections | 7 17 6 | 8 17 6 | |
| Flitch Plates | 8 5 0 | 8 15 0 | |
| Cast Iron Columns and Stanchions, including ordinary patterns | 7 0 0 | 8 0 0 | |

### METALS.

| | Per ton, in London. £ s. d. | £ s. d. | |
|---|---|---|---|
| IRON— Common Bars | 8 0 0 | 8 10 0 | |
| Staffordshire Crown Bars, good merchant quality | 8 10 0 | 9 0 0 | |
| Staffordshire "Marked Bars" | 10 10 0 | - - - | |
| Mild Steel Bars | 9 0 0 | 9 10 0 | |
| Hoop Iron, basis price | 9 5 0 | 9 15 0 | |
| ,, ,, galvanised | 16 0 0 | - - - | |
| (* And upwards, according to size and gauge.) | | | |
| Sheet Iron, Black.— Ordinary sizes to 20 g. | 10 0 0 | - - - | |
| ,, ,, to 24 g. | 11 0 0 | - - - | |
| ,, ,, to 26 g. | 12 10 0 | - - - | |
| Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g. | 12 10 0 | - - - | |
| ,, ,, 22 g. and 24 g. | 13 0 0 | - - - | |
| ,, ,, 26 g. | 14 0 0 | - - - | |
| Sheet Iron, Galvanised, flat, best quality:— Ordinary sizes to 20 g. | 16 10 0 | - - - | |
| ,, ,, 22 g. and 24 g. | 17 0 0 | - - - | |
| ,, ,, 26 g. | 18 10 0 | - - - | |
| Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g. | 12 10 0 | - - - | |
| ,, ,, 22 g. and 24 g. | 13 0 0 | - - - | |
| ,, ,, 26 g. | 14 0 0 | - - - | |
| Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker | 12 5 0 | - - - | |
| ,, ,, 22 g. and 24 g. | 13 5 0 | - - - | |
| ,, ,, 26 g. | 14 5 0 | - - - | |
| Cut nails, 3 in. to 6 in. | 9 10 0 | 10 0 0 | |
| (Under 3 in. usual trade extras.) | | | |

### LEAD, &c.

| | Per ton, in London. £ s. d. | £ s. d. | |
|---|---|---|---|
| LEAD—Sheet, English, 3 lbs. & up. | 14 5 0 | - - - | |
| Pipe in coils | 14 15 0 | - - - | |
| Soil Pipe | 17 5 0 | - - - | |
| ZINC—Sheet— Vieille Montagne ton | 24 10 0 | - - - | |
| Silesian | 24 0 0 | - - - | |
| COPPER— Strong Sheet per lb. | 0 1 0 | - - - | |
| Thin ,, | 0 1 1½ | - - - | |
| Copper nails ,, | 0 1 1½ | - - - | |
| BRASS— Strong Sheet ,, | 0 0 11 | - - - | |
| Thin ,, | 0 1 1 | - - - | |
| TIN—English Ingots ,, | 0 1 3 | - - - | |
| SOLDER—Plumbers' ,, | 0 0 6½ | - - - | |
| Tinmen's ,, | 0 0 8 | - - - | |
| Blowpipe ,, | 0 0 9 | - - - | |

### ENGLISH SHEET GLASS IN CRATES.

| | |
|---|---|
| 15 oz. thirds | 2½d. per ft. delivered. |
| ,, fourths | 2¾d. ,, ,, |
| 21 oz. thirds | 3½d. ,, ,, |
| ,, fourths | 3d. ,, ,, |
| 26 oz. thirds | 4¾d. ,, ,, |
| ,, fourths | 4d. ,, ,, |
| 32 oz. thirds | 5¾d. ,, ,, |
| ,, fourths | 5d. ,, ,, |
| Fluted sheet, 15 oz. | 3d. ,, ,, |
| ,, 21 ,, | 4d. ,, ,, |
| ½ Hartley's Rolled Plate | 2d. ,, ,, |
| ⅜ ,, ,, ,, | 2¾d. ,, ,, |
| ½ ,, ,, ,, | 2½d. ,, ,, |

### OILS, &c.

| | | £ s. d. | |
|---|---|---|---|
| Raw Linseed Oil in pipes | per gallon | 0 2 4 | |
| ,, ,, ,, in barrels | ,, | 0 2 10 | |
| ,, ,, ,, in drums | ,, | 0 3 0 | |
| Boiled ,, ,, in pipes | ,, | 0 2 11 | |
| ,, ,, ,, in barrels | ,, | 0 3 0 | |
| ,, ,, ,, in drums | ,, | 0 3 2 | |
| Turpentine, in barrels | ,, | 0 2 6 | |
| ,, in drums | ,, | 0 2 8 | |
| Genuine Ground English White Lead | per ton | 21 0 0 | |
| Red Lead, Dry | ,, | 20 10 0 | |
| Best Linseed Oil Putty | per cwt. | 0 8 6 | |
| Stockholm Tar | per barrel | 1 12 0 | |

### VARNISHES, &c.

| | Per gallon. £ s. d. |
|---|---|
| Fine Elastic Copal Varnish for outside work | 0 16 6 |
| Best Elastic Copal Varnish for outside work | 1 0 0 |
| Best Elastic Carriage Varnish for outside work | 0 16 0 |
| Best Hard Oak Varnish for inside work | 0 10 6 |
| Best Extra Hard Church Oak Varnish for inside work | 0 10 6 |
| Fine Hard Copal Varnish for inside work | 0 16 0 |
| Best Hard Copal Varnish for inside work | 1 0 0 |
| Best Hard Carriage Varnish for inside work | 0 16 0 |
| Extra Pale Paper Varnish | 0 12 0 |
| Best Japan Gold Size | 0 10 6 |
| Best Black Japan | 0 16 0 |
| Oak and Mahogany Stain | 0 9 0 |
| Brunswick Black | 0 8 6 |
| Berlin Black | 0 16 0 |
| Knotting | 0 10 0 |
| Best French and Brush Polish | 0 16 0 |

## TO CORRESPONDENTS.

J. S. M., W. S. (Amount should have been stated.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

*We cannot undertake to return rejected communications.*

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor

## TENDERS.

*** Next week communications for insertion under this heading must reach us *not later than 10 a.m.* on Wednesday, as, owing to the Easter holidays, we go to press a day earlier than usual.

* Denotes *accepted*. † Denotes *provisionally accepted*.

ABERDEEN.—For the erection of a church, Bieldside, for the Vestry. Mr. Arthur Clyne, architect, 123½, Union-street, Aberdeen. Quantities by architect:—

*Masonry.*—F. Morrison, Culter, Aberdeenshire* ....
*Carpentry.*—Hendry & Keith, Aberdeen*
*Plumbing.*—Blackie & Sons, Aberdeen* ....
*Slating.*—A. E. Merson, Aberdeen* ....
*Plastering.*—A. Stephen, Aberdeen* ....
*Painting and Glazing.*—E. Copland, Aberdeen* .... £1,724 16 6

BRADFORD.—For the extension of Rawson-place markets, for the Corporation. Messrs. T. C. Hope & Son, architects, 23, Bank-street, Bradford:—

| | |
|---|---|
| *Masonry.*—Obank & Sons, Bradford | £14 868 |
| *Ironfoundering.*—Taylor & Parsons, Bradford | 2,481 |
| *Plastering.*—Crabtree & Berry, Bradford | 565 |
| *Plumbing.*—Albert Ross, Shipley | 1,560 |
| *Slating.*—W. H. & E. Walton, Bingley | 322 |
| *Roof glazing of Market Hall.*—Helliwell & Co. Ltd., Brighouse | 495 |
| | £20,291 |

BROTHERTON (Yorks).—For the execution of works and materials to be supplied in and about the laying and jointing of 3,500 lineal yards or thereabouts of earthenware pipe sewers and cast-iron pipes, the construction of manholes, lamp-holes, flushing tanks, and all other appurtenances, the construction of boundary fence to works, tank, filtration areas, pumping-house, storage tank, &c., in connexion therewith, for the sewerage and sewage disposal of Brotherton, in the West Riding of the County of York, for the Pontefract Rural District Council. Mr. John Waugh, C.E., Sunbridge Chambers, Bradford:—

| | | | |
|---|---|---|---|
| H. Tyson | £6,759 0 | Egan & Sons | £4,717 0 |
| J. H. Bentley | 5,971 0 | Ward & Tetley | 4,498 0 |
| Milson Dixon | 5,345 0 | E. W. Ives | 4,367 10 |
| Jones Bros. | 5,310 0 | Wm. Sutcliffe, Sowerby Br.* | 4,320 0 |
| H. Dawson | 4,961 0 | | |
| Walter Binns | 4,760 0 | | |

BUNCRANA.—Two houses, Cockhill-road for Mr. P. Porter. Mr. J. P. McGrath, architect, 25, Carlisle-road, Londonderry:—

| | | | |
|---|---|---|---|
| H. Campbell | £600 | R. Colhoun, Londonderry* | £470 |

CARDIFF.—For the erection of a public convenience, Canton, for the Corporation. Mr. W. Harpur, C.E., Borough Engineer, Cardiff. Quantities by Borough Engineer:—

| | | | |
|---|---|---|---|
| W. T. Morgan | £242 | F. J. Robbins | £236 |
| F. Waterman | 239 | Price Bros | 223 |
| Melhuish Bros. | 228 | Knox & Wells* | 221 |

[All of Cardiff].

CARLISLE.—For the erection of two stone bridges, Longtown, for the Rural District Council. Mr. Jas. Murray, surveyor, The Courts, Carlisle:—

| | | |
|---|---|---|
| Murray & Son, Stapleton, Brampton | Raysburn Bridge | £211 2 8 |
| | Bog Burn Bridge | 168 10 5 |
| | | £379 13 1 |

[Surveyor's estimate, £380.]

DARTFORD.—For the supply of granite kerbing, &c., for the Urban District Council. Mr. W. Harston, surveyor, 8, Hythe-street, Dartford:—

*Paving Works on the Brent.*

| | | | |
|---|---|---|---|
| T. Adams | £277 0 0 | The Patent Victoria Stone Co. | £245 7 4 |
| W. H. Wheeler | 266 7 0 | Gibbs & Co., Ilford Wharf, | |
| W. Thair | 260 0 11 | Ilford, Essex* | 239 10 0 |
| Wallace & Inns | 246 17 0 | | |
| A. T. Catley | 246 0 0 | | |

*Paving Work in St. Alban's-road.*

| | | | |
|---|---|---|---|
| W. H. Wheeler | £75 0 0 | Wallace & Inns | £43 10 0 |
| Thomas Adams | 67 0 0 | A. T. Catley | 36 0 0 |
| Gibbs & Co. | 58 10 0 | | |

W. Thair, Salisbury-road, Bexley*, 1s. 4½d. per 3d.

EAST STANLEY (Durham).—For the erection of school buildings, for the Tanfield U. D. School Board. Mr. W. H. Bendle, architect, 23, Grainger-street West, Newcastle-on-Tyne. Quantities by architect:—

| | | | |
|---|---|---|---|
| G. T. Manners | £3,093 0 | A. Routledge | £2,850 0 |
| Reay & Sons | 2,910 0 | E. Taylor, Durham* | 2,785 3 |
| A. & R. Davis | 2,863 14 | | |

[*See also page 305.*

# COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

*(For some Contracts, &c., still open, but not included in this List, see previous issues.)*

## COMPETITIONS.

| Nature of Work. | By whom Advertised. | Premiums. | Designs to be delivered |
|---|---|---|---|
| *Proposed Public Offices | Aldershot U.D.C. | 100*l.*, 75*l.*, and 50*l.* | Mar. 29 |
| *Accident Hospital | Mexborough Montagu Hopstal | 25*l.*, 10*l.* | May 1 |
| *Memorial to the Queen Victoria, Guildhall, York | The Committee | 50*l.* | do |
| *Police and Fire Brigade Buildings | County Borough of Sunderland | 100*l.*, 50*l.*, and 25*l.* | Aug. 30 |

## CONTRACTS.

| Nature of Work or Materials. | By whom Advertised. | Forms of Tender, &c., Supplied by | Tenders to be delivered |
|---|---|---|---|
| Club Buildings, Amble, Northumberland | ..... | G. Reavell, Architect, Alnwick | Mar. 25 |
| Carriage Shed, Offices, &c., Irlams | Lancs. & Yorks. Railway Company | R. C. Irwin, Hunt's Bank, Manchester | do. |
| Additions to School, Keekle | ..... | J. S. Moffat, Architect, 53, Church-street, Whitehaven | do. |
| Church, Victoria-road, Kirkcaldy | ..... | W. Dow, Architect, 250, High-street, Kirkcaldy | do. |
| Groynes | ..... | S. E. Fisher, Surveyor, Town Hall, Felixstowe | do. |
| Boundary Walls | Felixstowe U.D.C. | H. L. Tacon, Architect, 11, Westgate, Rotherham | do. |
| Well Sinking, &c., Cliddesden | Rotherham Guardians | G. Fitton, Town Hall, Basingstoke | do. |
| Residence, Victoria-road, Elland, Yorks | Basingstoke Town Council | F. F. Beaumont, Architect, Southgate Chambers, Halifax | Mar. 26 |
| Alterations to Masonic Lodge, Dorchester | ..... | J. Feacey, South Walks, Dorchester | do. |
| Farm Buildings, Livingston, N.B. | ..... | Dalgleish & Bell, 1, Rutland-square, Edinburgh | do. |
| Workmens' Dwellings, Pilley Green, Birdwell, York | ..... | G. A. Wilson, Architect, Hartshead Chambers, Sheffield | do. |
| Church, Builth Wells, Wales | ..... | Habershon & Co., Architects, Pearl-street, Cardiff | do. |
| Additions, &c., to Sanatorium, Bengeworth | ..... | H. S. Harvey, Bengeworth, Evesham | do. |
| Chimney Shaft | Evesham Joint Hospital Board | P. Johns, Borough Surveyor, Guildhall, Maidenhead | do. |
| Manse, Quorn, Leicester | Maidenhead Town Council | Barrowcliff & Allcock, Architects, Leicester | do. |
| Additions to Offices, Eastcroft Depot | ..... | A. Brown, Civil Engineer, Guildhall, Nottingham | do. |
| Cast Iron Fire-escape Stairs | Nottingham Corporation | Mr. Dod, Architect, 16, Exchange Buildings, Liverpool | do. |
| Road Works, Shaw-lane | Ormskirk Guardians | J. H. Taylor, Civil Engineer, Manor House, Barnsley | do. |
| Road Works, Fairfax-road, &c. | Barnsley Corporation | C. Brownridge, Civil Engineer, Town Hall, Birkenhead | do. |
| *Erecting Electric Generating Station | Birkenhead Corporation | Council Surveyor, Guildhall, Maidenhead | do. |
| Additions to Hospital | Maidenhead Town Council | J. Perry, Architect, Galway | Mar. 27 |
| Concrete Wall, Cleethorpes Park | Oughterard Guardians | E. Ruahton, Civil Engineer, Poplar-road, Cleethorpes | do. |
| Water Works | Cleethorpes U.D.C. | Richardson & Hartley, Engineers, East Parade Chambers, Leeds | do. |
| Alterations to Stables, Coach-house, &c. | Castleford U.D.C. | F. W. Pearce, Surveyor, Town Hall, Twickenham | do. |
| Pumping Station Works | Twickenham U.D.C. | G. & F. W. Hodson, Engineers, Loughborough | do. |
| Chapel, Cwmdare, Aberdare | Ilkeston Water Board | Rev. D. Griffiths, 94, Bwlifa-road, Cwmdare | Mar. 28 |
| Residence, Gortin, Co. Tyrone | ..... | J. M. Robinson, Architect, 7, East Wall, Londonderry | do. |
| Villa, Hirwain, Aberdare | ..... | T. Roderick, Architect, Clifton-street, Aberdare | do. |
| Five Houses, Francs-street, Parkgate | Mr. T. Jones | J. Platts, Architect, High-street, Rotherham | do. |
| House, Mayfield, near Aberdeen | Mr. T. Naylor | Jenkins & Marr, Civil Engineers, 26, Bridge-street, Aberdeen | do. |
| Thirteen Cottages, Garndiffaith, Wales | ..... | A. Gay, Prospect Place, Garndiffaith | do. |
| Alterations to Farm Buildings, Belnaboth | ..... | Jenkins & Marr, Civil Engineers, 16, Bridge-street, Aberdeen | do. |
| Slaughter Houses | ..... | A. H. Dunkin, Surveyor, Town Hall, Great Harwood | Mar. 29 |
| Eight Houses, Mickley Riding | Great Harwood (Lancs) U.D.C. | Sadlnoch & Bruce, Architects, 55, Pilgrim-st., Newcastle-on-Tyne | do. |
| Restoration of Chapel, Trowbridge | ..... | W. W. Snailum, Architect, Church-street, Trowbridge | do. |
| Hospital, Trowbridge | ..... | W. J. Mann, Union Offices, Trowbridge | do. |
| Additions to Schools, Fairmantle-street, Truro | Hospital Committee | Carder & Carder, Architects, 4, Princes-street, Truro | do. |
| Hotel, Blaina, Mon. | ..... | T. Roderick, Architect, 50, Glebeland, Merthyr | Mar. 31 |
| Warehouse, Oak Mills, Clayton, Yorks | ..... | Milnes & France, Architects, 99, Swan-arcade, Bradford | do |
| Houses, Abercynon, Wales | Messrs. J. Benn & Co. | T. Davies, Navigation House Hotel, Abercynon | do. |
| Six Houses, Hengoed, Wales | Glancynon Building Club | P. Vivian Jones, Architect, Hengoed | do. |
| Infirmary, near Hull | ..... | Runton & Barry, Architects, Savile Chambers, Hull | do. |
| Cast Iron Water Main, near Keswick | Patrington Guardians | J. B. Wilson, Civil Engineer, Court Buildings, Cockermouth | do. |
| Villa, Merthyr Tydfil | Cockermouth R.D.C. | T. Roderick, Architect, 50, Glebeland, Merthyr | do. |
| Wesleyan Chapel, Madron, Cornwall | Mr. J. W. Lewis | H. Maddern, Architect, 26, Clarence-street, Penzance | do |
| Retorts | ..... | F. L. Schofield, 15, Cross-street, Barnstaple | do. |
| Cast Iron Water Main, Tallantire | Barnstaple Gas Company | J. B. Wilson, Civil Engineer, Court Buildings, Cockermouth | do. |
| Grand Stand, &c., Colne, Lancs | Cockermouth R.D.C. | R. S. Pilling, Architect, Colne | April 1 |
| Pavilion, Bangor, North Wales | ..... | F. Bellis, Architect, High-street, Bangor | April 2 |
| Presbyterian Manse, Ashington | Royal Nat. Eisteddfod of Wales | O. Blythe, Architect, Morpeth | do. |
| Engineer's Cottage at Ewell Sewerage Works | ..... | H. D. Searles Wood, 157, Wool Exchange, Colman-street, E.C. | do. |
| *Stoves and Ranges | Epsom R.D.C. | Clerk's Office, Union Workhouse, Leytonstone, N.E. | do. |
| *Granite Kerbing, &c., on Hove Sea Wall | West Ham Union | Borough Surveyor, Town Hall, Hove | do. |
| *Making-up Roads | Borough of Hove | Borough Engineer, Town Hall, Ealing, W. | April 3 |
| *Concert Hall, &c., at Westgate House | Ealing Town Council | Westgate Club and Institute, Dartford, Kent | April 4 |
| *Excavator, Bricklayer, and Mason's Work at York | Com. of Dartford Wrkg. Men's Clb. | W. Bell, Architect, York | do |
| *Reconstruction of Combined Drainage | North Eastern Railway | Medical Officer of Health, Town Hall, Fulham | April 5 |
| *New Roads, Muswell Hill | Metropolitan Borough of Fulham | Vigers & Co., 4, Frederick's-place, Old Jewry, E.C. | April 7 |
| *Married Couples' Quarters at Edmonton Workhouse | The Company | A. A. Kokwick, 18, Outer Temple, Strand | April 8 |
| *Gate Porter's Lodge, &c., Northern Fever Hospital | Strand Union | Office of the Board, Embankment, E.C. | April 10 |
| *Engineer's Cottage, Park Fever Hospl., Hither Green | Metropolitan Asylums Board | Office of the Board, Embankment, E.C. | do. |
| *Additions, &c., Higham Hall and Forest-road Schools | Metropolitan Asylums Board | H. Prosser, Architect, School Board Offices, Walthamstow | April 14 |
| *Erection of School, &c., Loxford Park Estate | Walthamstow School Board | C. J. Dawson, Architect, 7, Bank-buildings, Ilford, Essex | do. |
| *New Offices, &c., Brook-street Infirmary | Ilford School Board | Clerk to the Guardians, Brook-street, Kennington-road, S.E. | April 18 |
| *New Coastguard Buildings, near Falmouth | Lambeth Guardians | Director of Works Dept., Admiralty, 21, Northumberland-avenue | do |
| *Infants' School | Admiralty | H. Medland, Architect, 15, Clarence-street, Gloucester | May 21 |
| Stables, Sheds, &c., Grantley | Gloucester School Board | Bland & Bown, Architects, Harrogate | No date |
| Theatre, Halifax | Sir C. Furness | R. Horsfall & Son, Architects, Halifax | do |
| Additions to Church Schools, Potter's road | ..... | F. Child, Surveyor, 65, Chancery-lane, W.C. | do. |
| *Iron Buildings for Temporary Offices | Mountain Ash U.D.C. | The Surveyor, Town Hall, Mountain Ash | do. |

## PUBLIC APPOINTMENTS.

| Nature of Appointment. | By whom Required. | Salary. | Application to be in |
|---|---|---|---|
| *Clerk of Works | Borough of Shoreditch | 3*l.* 3*s.* per week | Mar. 26 |
| *Drainage Inspector | Metropolitan Borough of Fulham | 120*l.* | April 5 |
| *Surveyor's Assistant | Metropolitan Boro' of Woolwich | 130*l.* per annum | April 7 |
| *Assistant Clerk in Works Department | Paddington Borough Council | 100*l.* | April 8 |
| *Chief Engineer and Surveyor | County Borough of Northampton | 600*l.* per annum | April 16 |

*Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxii. Public Appointments, xviii. & xix.*

## TENDERS (*continued*)—

**ELTHAM.**—For the erection of the new depot for the London Parcels Delivery Co., Ltd., High-street, Eltham, Kent. Mr. Henry Poston, architect, 39, Lombard-street, E.C. :—

| | | | |
|---|---|---|---|
| Wm. Shepherd | £4,450 | Blyton & Sons, Kennington* | £3,925 |
| T. Knight | 4,319 | | |
| Jerrard & Son | 3,973 | | |

**GRAYS (Essex).**—For carrying out alterations and additions to The Elms, Grays, and putting in a system of hot-water heating to the satisfaction of Mr. Christopher M. Shiner, architect, 3, Bond-court, Walbrook, E.C. :—

| | | | |
|---|---|---|---|
| Wm. Potter | £1,650 | J. J. Lawrence | £1,545 |
| Hammond & Son | 1,589 | J. Brown* | 1,470 |

**HARROW.**—For additions to Greenhill Laundry. Mr. S. J. Reynolds, consulting engineer. Reigate :—

*Chimney and Boiler Seating.*

| | | | |
|---|---|---|---|
| Cross & Co. | £760 0 | Poulton & Son* | £710 10 |

*Sorting and Drying Rooms and Boiler House.*

| | | | |
|---|---|---|---|
| Funnell & Co. | £2,726 0 0 | Kiddle & Son | £2,309 0 0 |
| Lacy & Eyden | 2,539 0 4 | Akers & Co.* | 2,187 0 0 |
| Drake & Son | 2,350 0 0 | | |

**HASTINGS.**—For the erection of walls, fencing, also for drainage, &c., at the cemetery, for the Corporation. Mr. P. H. Palmer, C.E., Town Hall, Hastings :—

W. Smith, Silver Hill, St. Leonards .. £2,975 19 9

**HEREFORD.**—For the restoration of St. James's Church. Messrs. Nicholson & Hartree, architects, Hereford :—

| | | | |
|---|---|---|---|
| H. Smith | £5,707 0 0 | Lewis & Co. | £4,985 0 0 |
| King & Son | 5,688 0 0 | Bowers & Co. | 4,890 0 0 |
| Hatch & Sons | 5,400 0 0 | Beavan & Hodges | 4,682 0 0 |
| R. Morgan | 5,370 0 0 | C. Cooke, Hereford† | 4,402 0 0 |
| Broad & Co. | 5,307 2 6 | | |

† Revised and accepted.

**LEEK (Staffs.).**—For the erection of a poultry market, for the Urban District Council. Mr. John Myatt, surveyor, Town Hall, Leek :—

| | | | |
|---|---|---|---|
| T. Grace | £1,124 0 | J. Heath | £1,055 15 |
| S. Salt | 1,090 0 | Heath & Lowe, | |
| Embrey & Co. | 1,067 17 | Leek* | 940 0 |

**LONDON.**—For building casual wards, clothes-store, laundry, and other buildings at Gainsborough-road, Hackney Wick, for the Guardians of the Hackney Union. Mr. W. A. Finch, architect, 76, Finsbury-pavement, E.C. Quantities by Mr. G. T. G. Wright, 3, Great Winchester-street, E.C. :—

| | £ | Allowance per yard cube for sand. s. d. |
|---|---|---|
| A. Monk | 35,000 | 5 0 |
| Todd & Newman | 32,946 | — |
| Kirk & Randall | 31,313 | 3 0 |
| I. Appleby's | 30,990 | — |
| W. H. D. Kelland | 30,400 | 4 6 |
| McCormick & Sons | 29,876 | 3 6 |
| Coulson & Lofts | 29,800 | — |
| Thomas & Edge | 28,884 | 4 9 |
| Lawrance & Son | 28,500 | — |
| B. E. Nightingale | 28,500 | 5 0 |
| W. J. Clark | 28,419 | 3 6 |
| H. Lovatt | 28,300 | 3 6 |
| Chessum & Sons | 28,009 | 5 0 |
| Wilson Bros. & Lamplough | 27,856 | 4 0 |
| Killby & Gayford | 27,828 | 3 0 |
| Perry & Co. | 27,495 | 4 0 |
| Snewin Bros. | 27,243 | 4 6 |
| C. G. Hill | 26,985 | 5 0 |
| Shurmur & Sons | 26,946 | 5 0 |
| Dearing & Son | 24,983 | 3 0 |
| Herbert Bros., Corporation-street, West Ham, E.* | 24,100 | 4 0 |

**LONDON.**—For building new factory, Beaumont-road, Leyton, for Mr. W. H. Newall. Mr. W. A. Finch, architect, 76, Finsbury-pavement, E.C. :—

| | | | |
|---|---|---|---|
| T. L. Green | £2,765 | Perry Bros. | £2,477 |
| Lawrance & Sons | 2,762 | C. North | 2,455 |
| S. Kind | 2,640 | Barrett & Power | 2,372 |
| Shurmur & Sons | 2,493 | | |

**LONDON.**—For the erection of the Carters' Arms, Beckton-road, Canning Town, for Messrs. Savill Bros., Ltd. Mr. Henry Poston, architect, 39, Lombard-street, E.C. :—

| | | | |
|---|---|---|---|
| Todd & Newman | £1,659 | W. J. Maddison, Canning Town* | £1,435 |
| A. E. Symes | 1,587 | | |
| Blyton & Sons | 1,510 | | |

For three cottages adjoining the above :—

W. J. Maddison ..... £980

**LONDON.**—For receiving wards, officers' quarters, and waiting hall at Wandsworth Infirmary. Messrs. Mark J. Lansdell and Edmund J. Harrison, architects and surveyors, 65 and 66, Basinghall-street, E.C. :—

| | £ | Credit for Old Materials. |
|---|---|---|
| R. Neal | 17,442 | £242 |
| R. A. Jewel | 17,327 | 250 |
| Wilson, Bros. & Lamplough | 17,184 | 200 |
| Viney & Stone | 16,750 | 50 |
| W. Keys | 16,684 | 200 |
| Foster Bros. | 16,668 | 35 |
| T. G. Sharpington | 16,298 | — |
| W. Wallis | 16,184 | 190 |
| Lorden & Son | 15,888 | 111 |
| J. R. Ward | 15,547 | — |
| Sabey & Son | 15,545 | 160 |
| Smith & Son | 15,400 | 200 |
| Whitehead & Co. | 15,399 | 424 |
| C. G. Hill | 15,333 | 165 |
| Turtle & Appleton, Wandsworth* | 14,980 | 250 |
| E. Triggs | 14,950 | 200 |
| J. Appleby | 14,700 | 50 |
| Edwards & Medway | 14,690 | 170 |
| E. Chamberlain | 14,478 | 35 |

**LONDONDERRY.**—For residence at Lawrence-street (Foyle College Grounds), for Mr. W. N. McGuiness. Mr. J. P. McGrath, architect, 28, Carlisle-road, Londonderry :—

Alexander Dunlop, Sackville-street* ..... £580

Amended tender omitting painting and plumbing work.

**LONDONDERRY.**—Three cottages at Lecky-road for Miss Gallagher. Mr. J. P. McGrath, architect, 28, Carlisle-road, Londonderry :—

Gallagher & Sons, Moville* ..... £375

**MAESTEG (Wales).**—For the erection of school buildings, Blaenllynir, for the School Board. Messrs E. W. Burnett & Son, architects, Tondu, near Bridgend :—

| | | | |
|---|---|---|---|
| Isaac Rees | £3,065 10 | J. Jenkins, Caeran, Maesteg‡ | £2,895 0 |
| Cooksley & Co. | 3,040 0 | | |

‡ Accepted subject to approval of Education Department.

*Nantyffyllon Schools, Maesteg School Board.*

| | | | |
|---|---|---|---|
| Lewis & Sons | £1,450 0 | Henry Evans | £1,095 10 |
| Isaac Rees | 1,347 8 | Stephen Lewis, Maesteg‡ | 1,050 0 |
| Cooksley & Co. | 1,330 0 | | |

‡ Accepted subject to approval of Education Department.

**MANOR PARK (Essex).**—For the erection of the new Earl of Essex Hotel, Manor Park, Essex, for Mr. Joseph Hill. Mr. Henry Poston, architect, 39, Lombard-street, E.C. Quantities by Mr. J. Rookwood, 23, Bedford-row, W.C. :—

*Contract No. 1.—Foundations and Substructure.*

| | | | |
|---|---|---|---|
| Blyton & Sons | £1,550 | Todd & Newman | £1,369 |
| Mowlem & Co. | 1,507 | W. J. Maddison, Canning Town* | 1,285 |
| Hall, Beddall, & Co. | 1,462 | | |

*Contract No. 2.—Superstructure.*

| | | | |
|---|---|---|---|
| Hall, Beddall, & Co. | £13,800 | Blyton & Sons | £13,515 |
| John Mowlem & Co. | 13,693 | W. J. Maddison, Canning Town* | 13,355 |
| Todd & Newman | 13,609 | | |

**MARYPORT.**—For the erection of a cottage hospital. Mr. C. Eaglesfield, architect, Maryport :—

| | | |
|---|---|---|
| *Masonry.*—W. Marshall, Maryport* | £568 | 9 0 |
| *Joinery.*—J. Kendall, Maryport* | 290 | 0 0 |
| *Slating.*—M. Clark, Nesherton* | 88 | 0 0 |
| *Plastering.*—T. Kirk, Nesherton | 175 | 0 0 |
| *Plumbing.*—W. Thompson, Maryport* | 114 | 11 9 |
| *Painting and Glazing.*—J. McKay, Maryport* | 26 | 10 9 |

**NEWCASTLE-UNDER-LYME (Staffs.).**—For the erection of two houses. Mr. Wm. Campbell, architect, 2, Bagnall-street, Hanley :—

S. Heath, Victoria-road, Basford, Stoke-on-Trent* ..... £797

**NEWPORT (Mon.).**—For the erection of stabling for thirty-four horses, for Messrs. Phillips & Sons. Messrs. Habershon, Fawckner, & Groves, architects, 41, High-street, Newport. Quantities by the architects :—

| | | | |
|---|---|---|---|
| Jones & Son | £6,187 | A. E. Parfitt | £5,662 |
| Lawson & Co. | 6,183 | Leadbeter Bros. | 5,597 |
| J. Linton | 5,961 | C. H. Reed | 5,509 |
| Smith Bros. | 5,870 | F. W. Powles | 5,438 |
| Dyson Parfitt | 5,819 | D. W. Richards | 5,298 |
| E. C. Jordan | 5,787 | Jessett & Fisher | 5,245 |
| C. Locke | 5,750 | J. Hooper* | 5,185 |
| D. J. Davies | 5,732 | [All of Newport.] | |
| A. S. Morgan | 5,683 | | |

**NEWPORT (Mon.).**—For additions to the Newport Arcade. Messrs. Habershon, Fawckner, & Groves, architects, High-street, Newport :—

| | | | |
|---|---|---|---|
| Jessett & Fisher | £399 | J. Hooper | £350 |
| W. J. Williams | 390 | Leadbeter Bros. | 327 |
| D. W. Richards, Ltd. | 358 | E. C. Jordan* | 320 |

[All of Newport.]

**SALISBURY.**—For building new residence—from Plinth level—at Milford Manor, Salisbury, for Mr. Richard Gerrish. Mr. Fred Bath, architect, Salisbury :—

| | | | |
|---|---|---|---|
| Guppy & Chant | £12,000 | 0 | 0 |
| Holliday & Greenwood, Ltd. | 8,557 | 0 | 0 |
| J. Downham | 8,386 | 2 | 7 |
| C. H. Gibson | 7,965 | 0 | 0 |
| Harris & Son | 7,949 | 0 | 0 |
| Exors. of the late W. Franklin | 7,916 | 13 | 0 |
| Merrick & Son | 7,908 | 0 | 0 |
| C. H. Green | 7,900 | 0 | 0 |
| H. Cawte | 7,834 | 2 | 0 |
| B. E. Nightingale | 7,800 | 0 | 0 |
| Shillitoe & Son | 7,800 | 0 | 0 |
| Bailey & Marlow | 7,765 | 10 | 0 |
| Webb & Co. | 7,595 | 0 | 0 |
| T. Dawkins | 7,550 | 0 | 0 |
| W. Beazley, Calne, Wilts* | 7,489 | 0 | 0 |

* Accepted, subject to deductions amounting to £700.

**SUDBURY (Harrow).**—For alterations and additions to Tyon Villas, Sudbury, Harrow, for Mr. Martin Morris. Messrs. Higgs & Rudkin, architects, 25, John-street, Bedford-row, W.C. :—

| | | | |
|---|---|---|---|
| John Milroy | £127 15 | Parfitt & Co.* | £117 15 |

## LONDON SCHOOL BOARD TENDERS.

**AT the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect :—**

* *Recommended for acceptance.*

**BONNER-STREET SCHOOL (Bethnal Green).**—Works to offices, &c. :—

| | | | |
|---|---|---|---|
| Barrett & Power | £446 | Stevens Bros. | £368 |
| J. Peattie | 425 | F. Bull* | 321 |
| Marchant & Hirst | 395 | | |

**CHEQUER-STREET SCHOOL, BUNHILL-ROW, ST. LUKE'S.**—Sanitary and drainage works :—

| | | | |
|---|---|---|---|
| G. Neal | £2,157 | Williams & Son | £1,998 |
| The Sanitary Lead Lining and Pipe Bending Co., Ltd. | 2,104 | J. Peattie | 1,966 |
| | | Willmott & Sons | 1,960 |
| L. H. & R. Roberts | 2,068 | Stevens Bros. | 1,949 |
| Johnson & Co. | 2,051 | Ashby & Horner | 1,943 |
| | | F. Bull* | 1,889 |

**POCOCK-STREET SCHOOL (Blackfriars).**—Drainage and sanitary works :—

| | | | |
|---|---|---|---|
| J. & M. Patrick | £5,217 | J. & C. Bowyer | £2,937 |
| Rice & Son | 3,293 | Johnson & Co. | 2,935 |
| Leney & Son | 3,194 | Falkner & Sons | 2,893 |
| Maxwell Bros., Ltd. | 3,176 | G. Parker* | 2,875 |
| W. Downs | 3,090 | | |

**"PULTENEY" SCHOOL (Berwick-street, Soho).**—For sanitary and drainage works :—

| | | | |
|---|---|---|---|
| G. Neal | £2,145 0 | J. Peattie | £1,988 0 |
| Johnson & Co. | 2,112 0 | R. P. Beattie* | 1,764 18 |
| L. & R. Roberts | 1,994 0 | | |

**REPAIRS ON REVISED SCHEDULE OF PRICES.**—For executing repairs to schools and to head offices of the Board on revised schedule of prices :—

| Division. | Groups. | — | Percentage to be added on the Schedule for Work comprised in a Repairs. Measured Work. | b Sanitary. Measured Work. | c Daywork. |
|---|---|---|---|---|---|
| City | — | H. Line, 81, Peckham Rye S.E.* | 7½ | 10 | S |
| Chelsea | 1 and 2 | W. R. & A. Hide, 3, Carthew-villas, Hammersmith, W.* | 10 | 10 | 10 |
| ,, | 3 | E. B. Tucker, 82, Lavender-hill, S.W.* | S | 7½ | S |
| ,, | 4 | J. & M. Patrick, Wandsworth, S.W.* | 9½ | 9½ | 9½ |
| Finsbury | 1 and 2 | Johnson & Co., 97 and 99, Southwark Bridge-road, S.E.* | 10 | 15 | 7½ |
| Greenwich | 1, 2, 3, and 5 | Kirk & Randall, Woolwich, S.E.* | 10 | 15 | 10 |
| ,, | 4 and 6 | G. Kemp, 43, High-street, Sydenham, S.E.* | 10 | 10 | 10 |
| East Lambeth | 1 and 2 | H. Line, 81, Peckham Rye, S.E.* | S | 9 | S |
| ,, | 3 and 4 | Maxwell Bros., Ltd., 310, Brixton-road, S.W.* | 7 | 15 | 7 |
| ,, | 5 | Maxwell Bros., Ltd., 310, Brixton-road, S.W.* | 7 | 15 | S |
| West Lambeth | 1 | Rice & Son, 15, Stockwell-road, S.W.* | S | 15 | S |
| ,, | 2 | Maxwell Bros., Ltd., 310, Brixton-road, S.W.* | 2½ | S | 2½ |
| ,, | 3 | E. B. Tucker, 82, Lavender-hill, S.W.* | S | S | S |
| ,, | 4 | E. Triggs, 92, The Chase, Clapham, S.W.* | 7½ | 10 | 15 |
| ,, | 5 | Garrett & Son, 17, Balham-hill, S.W.* | 10 | 10 | 10 |
| ,, | 6 | G. Kemp, 43, High-street, Sydenham, S.E.* | 10 | 10 | 10 |
| Southwark | 1 and 2 | H. Line, 81, Peckham, Rye, S.E.* | 5 | 9 | S |
| ,, | 3 | Marsland & Sons, 1, York-street, Walworth, S.E.* | 12½ | 25 | 12½ |
| ,, | 4 | Marsland & Sons, 1, York-street, Walworth, S.E.* | 12 | 25 | 10 |
| Westminster | — | Lathey Bros., St. George's Works, New-road, Battersea Park, S.W.* | 12½ | 17½ | 10 |
| Board Offices | — | T. L. Green, 65 and 66, Eagle-street, Holborn, W.C.* | 15 | 15 | 15 |

"S" means at the Schedule of Prices.

[*See also next page.*

TOWNMEAD-ROAD SITE (Fulham).—New school in accordance with revised plans. The Board of Education have sanctioned the erection of a school on the site in Townmead-road, Fulham (Sub-Division Q[1] of Chelsea), to provide accommodation for 1,080 children. Upon this site three temporary iron buildings have been provided and are now in use. The school, which is a three-story building, contains the following accommodation: boys, 320; girls, 320; infants, 320; total, 960. Graded school on three stories. Halls: boys, girls', and infants', 30 ft. by 28 ft. each. Classrooms: boys' and girls' each, 48, 48, 48, 48, 48, 40, 40; infants', 48, 48, 48, 48, 30, 40, 40. Drawing classroom, 1,247 ft. area; manual centre for 20. Heating by open fires and stoves. Area of site, 71,050 sq. ft. Playgrounds, area per child: boys', about 7⅚ ft.; girls' and infants', about 4⅜ ft. A schoolkeeper's house is also included in the plans:—

| | | | |
|---|---|---|---|
| Miskin & Sons | £28,187 | C. Cox | £25,210 |
| Lathey Bros. | 26,547 | Kirk & Randall | 25,210 |
| Simpson & Son | 26,422 | McCormick & Sons | 24,643 |
| Leslie & Co., Ltd. | 26,161 | Stimpson & Co. | 24,600 |
| Gough & Co. | 26,111 | Smith & Sons, Ltd. | 24,560 |
| Wallis & Sons | 25,548 | Spencer, Santo, & Co., Ltd. | 24,554 |
| Lawrance & Sons | 25,519 | Lorden & Son | 24,444 |
| J. & M. Patrick | 25,390 | Holloway Bros. | 24,406 |
| King & Son | 25,240 | Johnson & Co., Ltd.* | 23,950 |
| Treasure & Son | 25,218 | | |

WOOD'S-ROAD SCHOOL (Peckham).—For heating works:—

| | | | |
|---|---|---|---|
| Cannon & Sons | £849 0 | Duffield & Sons | £635 0 |
| Stevens & Sons | 845 0 | J. C. Christie | 625 0 |
| J. & F. May | 820 0 | The Paragon Heating Co* | 518 0 |
| J. Eason | 705 14 | | |
| J. Grundy | 675 0 | | |

BRUSHES.—Running contract for the supply of flue brushes, &c.:—

| | | Mechanical Appliance Co.* £ s. d. |
|---|---|---|
| Flue brushes, No. 1 | per dozen | 0 10 6 |
| ,, No. 2 | ,, | 0 9 6 |
| ,, No. 3 with two rods complete | ,, | 4 16 0 |
| ,, No. 4 | ,, | 1 0 0 |
| ,, No. 5 | ,, | 0 13 0 |
| Bamboo rods for brushes, No. 3 | ,, | 0 2 0 |

HEATING APPARATUS—on revised schedule of prices.—For repairs to heating apparatus in schools:—

| Groups. | | Percentage to be added to or deducted from schedule prices. |
|---|---|---|
| 1 | J. Eason, 102-7, Fetter-lane, E.C.* | At schedule prices. |
| 2 | Palowkar & Sons, 90 and 91, Queen-street, E.C.* | ,, |
| 3 | J. C. Christie, 3 and 5, Mansell-street, Aldgate, E.* | 2½ |
| 4 | Knight & Sons, 222, Great Portland-street, W.* | —5 |
| 5 | J. Eason, 102-7, Fetter-lane, E.C.* | At schedule prices. |
| 6 | G. Davis, 28, Silver-st., Kensington, W.* | ,, |
| 7 | Wenham & Waters, Ltd., Croydon* | 5 |
| 8, 9, and 10 | Cannon & Sons, 107, London-road, Southwark, S.E.* | At schedule prices. |
| 11 | J. Eason, 102-7, Fetter-lane, E.C.* | ,, |
| 12 | Wenham & Waters, Ltd., Croydon* | 5 |

HEAD OFFICES OF THE BOARD.—For periodical inspection of lifts:—

| | Per annum. | | Per annum. |
|---|---|---|---|
| R. Middleton | £60 0 | Easton & Co., Ltd. | £15 0 |
| Moffatt & Eastmead, Ltd. | 30 0 | Clements, Jeakes & Co.* | 24 0 |
| W. T. Rounsivell | 33 0 | C. & A. Musker, Ltd. | 20 0 |
| Waygood & Co., Ltd. | 29 10 | | |

LOCKS, &c.—For locks and ironmongery for new schools, enlargements, &c.

(a) Parkes & Co., New-road, Willenhall.
(b) Rowland Hodges, Queen Victoria-street, E.C.
(c) Pryke & Palmer, Upper Thames-street, E.C.
(d) Nettlefold & Sons, High Holborn, W.C.

MAP AND DIAGRAM TABLES.—Supply of map and diagram tables:—

| | Each. | | Each. |
|---|---|---|---|
| Spencer & Co. | £10 12 6 | North of England School Furnishing Co. | £6 10 0 |
| Educational Supply Association, Ltd. | 8 19 0 | London School Furniture Co. | 6 8 0 |
| Marchant & Hirst | 7 15 0 | T. Cruwys | 6 5 0 |
| Lascelles & Co. | 7 3 0 | Pearson & Brown | 5 10 0 |
| H. Bouneau | 6 10 0 | Waring & Sons, Ltd.* | 5 7 6 |

OIL AND SUNDRIES.—Running contract for supply of oil and sundries for outdoor staff of Warming Engineer's sub-department:—

* Messrs. W. H. Wilcox & Co., of Nos. 34 and 36, Southwark-street, S.E., for the supply of oil and other sundries, with the exception of belt syrup.


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